

# Receiving Report

Date:

16-04-11

Batch No:

134537

Supplier:

East Coast

Dart P/O:

31952

Packing Slip:

Yes ☒

No ☐

Invoice:

Yes ☒

No ☐

Receipt:

Cash ☐

Cr ☒

New Supplier

Yes ☐

No ☒

Release Note Attached:

Yes ☒

No ☐

N/A ☐

Waybill Attached:

Yes ☒

No ☐

N/A ☐

Shipment Complete:

Yes ☐

No ☒

N/A ☐

QC18 Inspection

N/A ☒

Work Order

N/A ☒

## Discrepancies

Part Number	Description	Quantity Ordered	Quantity Rec'd	Quantity Short	Quantity Inspected	Quantity Rejected	Comment / NCR Number

Initials of Receiver

QC12

SP

Production/Admin:

Date

Received/Costing

Initial

Location



MS\Purchasing\approved purch\RECREPORT





Dart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7.  
Tel: 613 632 9577  
Fax: 613-632 1053

# PURCHASE ORDER

Purchase Order ID **PO31952**

Purchase Order Date 4/6/2016

PO Print Date 4/6/2016

Page Number 1 of 4

**Order From :**

VU-EC001

**Ship To :** DART AEROSPACE LTD

EAST COAST AVIATION SUPPLIES, INC.  
399 EAST DRIVE  
MELBOURNE, FLORIDA 32904  
USA

1270 ABERDEEN  
HAWKESBURY, ON K6A 1K7  
CANADA

**E-MAILED**

**Contact Name**

**Vendor Phone**

1-321-727-0047

**Ship To Contact**

**Ship To Phone**

**Ship Via:**

FedEx Economy collect

**Ship Acct:**

**Buyer**

**Customer POID**

**Customer Tax #**

**Terms**

**Currency**

**FOB**

Chantal Lavoie

10127-2607

Net 30

USD

FCA - (Free Carrier)

APR 06 2016

m134537

Line Nbr	Reference Vendor Part Number Line Comments Delivery Comments	Description/ Mfg ID	Req Date/ Taxable Promise Date	CD	Req Qty/ Unit of Measure	PO Unit Price	Extended Price
1	AN3-3A ✓	Bolt	4/8/2016 Yes 4/8/2016	FN	100.00 ✓ Each	\$0.07	\$7.00 ✓
						<b>Line Total:</b>	<b>\$7.00</b>
2	AN3C13A ✓	Bolt	4/8/2016 Yes 4/8/2016		20.00 ✓ Each	\$0.54 178.	\$10.80 15 ba
						<b>Line Total:</b>	<b>\$10.80</b>
3	AN4-51A ✓	Bolt	4/8/2016 Yes 4/8/2016	FN	100.00 Each	\$3.10	\$310.00

Note:

4/6/2016

recu 49 k.

SP16-04-11

350

349

over call.



Dart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7  
Tel: 613 632 9577  
Fax: 613 632 1053

# PURCHASE ORDER

Purchase Order ID-PO31952

Purchase Order Date: 4/6/2016

PO Print Date 4/6/2016

Page Number 2 of 4

Order From :

VU-EC001

Ship To : DART AEROSPACE LTD

EAST COAST AVIATION SUPPLIES, INC.  
399 EAST DRIVE  
MELBOURNE, FLORIDA 32904  
USA

1270 ABERDEEN  
HAWKESBURY, ON K6A 1K7  
CANADA

Contact Name

Vendor Phone

1-321-727-0047

Ship To Contact

Ship To Phone

Ship Via:

FedEx Economy collect

Ship Acct:

Buyer

Chantal Lavoie

Customer POID

Customer Tax #

10127-2607

Terms

Net 30

Currency

USD

FOB

FCA - (Free Carrier)

Line Total: \$310.00

4 CR3212-4-5 ✓

Cherry Rivet

4/8/2016

Yes

4/8/2016

100.00 ✓

Each

\$0.36

\$36.00

36.00

Line Total: \$36.00

5 MS20004-24 ✓

Bolt

4/8/2016

Yes

4/8/2016

10.00 ✓

Each

\$4.75

\$47.50

55.18

Line Total: \$47.50

6 MS21042L06 ✓

Nut

4/8/2016 FN

Yes

4/8/2016

50.00

Each

\$0.15

\$7.50

18.00

Line Total: \$7.50

Note:

4/6/2016

SP16-04-11.  
new 100%.



Dart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A-1K7  
Tel: 613 632 9577  
Fax: 613 632 1053

# PURCHASE ORDER

Purchase Order ID-PO31952

Purchase Order Date 4/6/2016

PO Print Date 4/6/2016

Page Number 3 of 4

Order From :

VU-EC001

Ship To : DART AEROSPACE LTD

EAST COAST AVIATION SUPPLIES, INC.  
399 EAST DRIVE  
MELBOURNE, FLORIDA 32904  
USA

1270 ABERDEEN  
HAWKESBURY, ON K6A 1K7  
CANADA

Contact Name

Vendor Phone

1-321-727-0047

Ship To Contact

Ship To Phone

Ship Via:

FedEx Economy collect

Ship Acct:

Buyer

Chantal Lavoie

Customer POID

Customer Tax #

10127-2607

Terms

Net 30

Currency

USD

FOB

FCA - (Free Carrier)

7	MS27039-1-24 ✓	Screw	4/8/2016 FN	20.00 ✓	\$0.16	\$3.20
			Yes	Each		19.00
			4/8/2016			

*new 100%*

Line Total: \$3.20

8	MS29512-06 ✓	O-RING	4/8/2016	20.00 ✓	\$0.36	\$7.20 ✓
			Yes	Each		
			4/8/2016			

Line Total: \$7.20

9	MS21250-06018 ✓	BOLT	4/8/2016	12.00 ✓	\$3.25	\$39.00 ✓
			Yes	Each		
			4/8/2016			

*8/6-01-11*

Line Total: \$39.00

Note:

4/6/2016



Dart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7  
Tel: 613 632 9577  
Fax: 613 632 1053

# PURCHASE ORDER

Purchase Order ID PO31952

Purchase Order Date 4/6/2016

PO Print Date 4/6/2016

Page Number 4 of 4

Order From :  
EAST COAST AVIATION SUPPLIES, INC.  
399 EAST DRIVE  
MELBOURNE, FLORIDA 32904  
USA

VU-EC001

Ship To : DART AEROSPACE LTD  
1270 ABERDEEN  
HAWKESBURY, ON K6A 1K7  
CANADA

Contact Name  
Vendor Phone 1-321-727-0047  
  
Ship To Contact  
Ship To Phone  
Ship Via: FedEx Economy collect  
Ship Acct:

Buyer Chantal Lavoie  
Customer POID  
Customer Tax # 10127-2607  
Terms Net 30  
Currency USD  
FOB FCA - (Free Carrier)

10	71401-45	PROCUREMENT QUALITY CLAUSES	4/8/2016	1.00	\$0.00	\$0.00
----	----------	--------------------------------	----------	------	--------	--------

No

4/8/2016

Procurement Quality Clauses  
A005 RIGHT OF ENTRY  
A012 CHEMICAL AND PHYSICAL TEST REPORTS  
A016 PERSONNEL QUALIFICATION  
A026 CERTIFICATION OF MATERIAL CONFORMANCE  
A032 PUBLIC LAW 101-592 FASTENER QUALITY ACT  
A033 STATEMENT OF CONFORMITY/TEST RECORDS  
FOR NAS, AN and MS FASTENERS  
A040 NOTIFICATION OF QUALITY ESCAPE  
A041 QUALITY MANAGEMENT SYSTEM  
A043 RETENTION OF QUALITY DOCUMENT

Line Total: \$0.00

PO Total: \$468.20

Note: Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit [www.dartaerospace.com](http://www.dartaerospace.com) for further explanation.

Change Nbr: 1

Change Date: 4/6/2016



# Packing Slip

Invoice #: 558133  
Date Printed: 4/7/2016  
Time: 4:46:29 PM  
# of Items: 9  
Page: 1

**To:**  
DART AEROSPACE LTD.  
ACCTS. PAYABLE  
1270 ABERDEEN STREET  
HAWKESBURY, ON K6A1K7  
CANADA

ATTN: CHANTAL LAVOIE  
Ph: 613.632.3336 Fax: 613.632.5246

**Ship To:**  
DART AEROSPACE LTD.  
ATTN: RECEIVING  
1270 ABERDEEN STREET  
HAWKESBURY, ON K6A1K7  
Canada

Invoice Date: 4/7/2016  
Order Date: 4/7/2016  
Ship Date: 4/7/2016  
Sales Order: 498764  
Customer #: 16754

Terms: NET 30  
Cust. PO#: PO31952  
FOB: MELBOURNE, FL

AWB: 665770279800

Weight: 8

# of Boxes:  
Shipment #:

ECAS Contact:

Ship Via: 113- FX INT ECON

Item	Part Number/Description	Shipped	BackOrd	CD	UoM
1	AN3-3A BOLT UNDRILLED ✓	100.00 ✓	0.00	NE	
2	AN3C13A BOLT UNDRILLED S/S ✓	20.00 ✓	0.00	NE	
3	AN4-51A BOLT UNDRILLED ✓	24.00 ✓	2.00	NE	
4	CR3212-4-05 CHERRY RIVET ✓	100.00 ✓	0.00	NE	
5	MS20004-24 BOLT ✓	10.00 ✓	0.00	NE	
6	MS21042L06 SELF LOCKING NUT ✓	100.00 ✓	0.00	NE	
7	MS27039-1-24 STRUCTURAL SCREW ✓	100.00 ✓	0.00	NE	
8	MS29512-06 O'RING ✓	20.00 ✓	0.00	NE	
9	MS21250-06018 BOLT ✓	12.00 ✓	0.00	NE	

Special Instructions:

Authorized Signature:



# Invoice

INVOICE #: 558133  
 DATE PRINTED: 4/7/2016  
 TIME: 4:46:14 PM  
 # OF ITEMS: 9  
 PAGE: 1

**TO:** DART AEROSPACE LTD.  
 ACCTS. PAYABLE  
 1270 ABERDEEN STREET  
 HAWKESBURY, ON K6A1K7  
 CANADA

ATTN: CHANTAL LAVOIE  
 Ph: 613.632.3336 Fax: 613.632.5246

**SHIP TO:** DART AEROSPACE LTD.  
 ATTN: RECEIVING  
 1270 ABERDEEN STREET  
 HAWKESBURY, ON K6A1K7  
 Canada

INVOICE DATE: 4/7/2016      TERMS: NET 30      WEIGHT: 8      SHIP VIA: 113- FX INT ECONOMY  
 ORDER DATE: 4/7/2016      CUST PO: PO31952      # OF BOXES:  
 SHIP DATE: 4/7/2016      FOB: MELBOURNE, FL      SHIPMENT #: 0  
 SALES ORDER #: 498764      AWB: 665770279800      ECAS CONTACT: Luis Sepulveda  
 CUSTOMER #: 16754

ITEM	PART NUMBER/DESCRIPTION	SHIPPED	B/O	CD	UNIT PRICE	UOM	TOTAL AMT
1	AN3-3A BOLT UNDRILLED MFR: AFC QTY: 100 LOT: 25270 ECCN: 9A991 Schedule B: 7318.15.2000	100.00	0.00	NE	0.0700	EA	\$7.0000
2	AN3C13A BOLT UNDRILLED S/S MFR: AFC QTY: 20 LOT: 23844 ECCN: 9A991 Schedule B: 7318.15.2091	20.00	0.00	NE	0.7800	EA	\$15.6000
3	AN4-51A BOLT UNDRILLED MFR: AFC QTY: 24 LOT: 14474 ECCN: 9A991 Schedule B: 7318.15.2000	24.00	2.00	NE	3.1000	EA	\$74.4000
4	CR3212-4-05 CHERRY RIVET MFR: CHERRY QTY: 100 LOT: 87856828 ECCN: 9A991 Schedule B: 8803.30.0010	100.00	0.00	NE	0.3600	EA	\$36.0000
5	MS20004-24 BOLT MFR: HEARTLAND QTY: 5 LOT: 43036 ECCN: 9A991 Schedule B: 7318.15.2000 MFR: HEARTLAND QTY: 5 LOT: 30237 ECCN: 9A991 Schedule B: 7318.15.2000	10.00	0.00	NE	5.5000	EA	\$55.0000
6	MS21042L06 SELF LOCKING NUT 100.00	100.00	0.00	NE	0.1800	EA	\$18.0000

SPECIAL INSTRUCTIONS:

AUTHORIZED SIGNATURE

*5016-04-11*



# Invoice

INVOICE #: 558133  
 DATE PRINTED: 4/7/2016  
 TIME: 4:46:15 PM  
 # OF ITEMS: 9  
 PAGE: 2

**TO:** DART AEROSPACE LTD.  
 ACCTS. PAYABLE  
 1270 ABERDEEN STREET  
 HAWKESBURY, ON K6A1K7  
 CANADA

ATTN: CHANTAL LAVOIE  
 Ph: 613.632.3336 Fax: 613.632.5246

**SHIP TO:** DART AEROSPACE LTD.  
 ATTN: RECEIVING  
 1270 ABERDEEN STREET  
 HAWKESBURY, ON K6A1K7  
 Canada

INVOICE DATE: 4/7/2016      TERMS: NET 30      WEIGHT: 8      SHIP VIA: 113- FX INT ECONOMY  
 ORDER DATE: 4/7/2016      CUST PO: PO31952      # OF BOXES:  
 SHIP DATE: 4/7/2016      FOB: MELBOURNE, FL      SHIPMENT #: 0  
 SALES ORDER #: 498764      AWB: 665770279800      ECAS CONTACT: Luis Sepulveda  
 CUSTOMER #: 16754

ITEM	PART NUMBER/DESCRIPTION	SHIPPED	B/O	CD	UNIT PRICE	UOM	TOTAL AMT
7	<div> <div>MFR: AFC QTY: 100</div> <div>LOT: 19141</div> </div> <div> <div>ECCN: 9A991</div> <div>Schedule B: 7318.16.0030</div> </div> <div>MS27039-1-24 STRUCTURAL SCREW</div>	100.00	0.00	NE	0.1900	EA	\$19.0000
8	<div> <div>MFR: LFC QTY: 100</div> <div>LOT: 51034</div> </div> <div> <div>ECCN: 9A991</div> <div>Schedule B: 7318.15.4000</div> </div> <div>MS29512-06 O-RING</div>	20.00	0.00	NE	0.3600	EA	\$7.2000
9	<div> <div>MFR: PARKER QTY: 20</div> <div>LOT: 0080235706</div> </div> <div> <div>ECCN: EAR99</div> <div>Schedule B: 4016.93.1010</div> </div> <div>MS21250-06018 BOLT</div>	12.00	0.00	NE	3.2500	EA	\$39.0000
	<div> <div>MFR: HEARTLAND QTY: 12</div> <div>LOT: 41771</div> </div> <div> <div>ECCN: 9A991</div> <div>Schedule B: 7318.15.2000</div> </div> <div>*** Order Not Complete ***</div>						

## SPECIAL INSTRUCTIONS:

## AUTHORIZED SIGNATURE

SUB TOTAL: \$271.2000  
 TAX TOTAL: \$0.0000  
 MISC CHARGE: \$0.0000  
 FREIGHT: \$0.0000  
 TOTAL: \$271.20  
 USD

# ECAS, LLC

## CUSTOMS INVOICE

No: H961153

### Package Details:

### Deliver To:

Number of Pieces: Total Weight: 8	<b>DART AEROSPACE LTD.</b> <b>ATTN: RECEIVING</b> <b>1270 ABERDEEN STREET</b> <b>HAWKESBURY, ON K6A1K7</b> <b>Canada</b>
--------------------------------------	--

Carrier	A/W Bill	Flight Number/Date	House A/W Bill
113- FX INT ECONOMY 151793240	665770279800		

Qty	Part No.	Description	Serial Number	Origin	Value	Ext Value	Cust. PO#
100	AN3-3A ✓	BOLT UNDRILLED			USC \$7.0000	\$7.0000	PO31952
20	AN3C13A ✓	BOLT UNDRILLED S/S			USC \$15.6000	\$15.6000	PO31952
24	AN4-51A ✓	BOLT UNDRILLED			USC \$74.4000	\$74.4000	PO31952
100	CR3212-4-05 ✓	CHERRY RIVET			USC \$36.0000	\$36.0000	PO31952
5	MS20004-24 ✓	BOLT			USC \$27.5000	\$27.5000	PO31952
5	MS20004-24 ✓	BOLT			USC \$27.5000	\$27.5000	PO31952
100	MS21042L06 ✓	SELF LOCKING NUT			USC \$18.0000	\$18.0000	PO31952
100	MS27039-1-24 ✓	STRUCTURAL SCREW			USC \$19.0000	\$19.0000	PO31952
20	MS29512-06 ✓	O'RING			USC \$7.2000	\$7.2000	PO31952
12	MS21250-06018 ✓	BOLT			USC \$39.0000	\$39.0000	PO31952

*Sold 04/11*

**Total: \$243.7000**

**Home Total: \$243.7000**

The goods are supplied to you under the terms of your end-use.  
 I do hereby declare to the best of my knowledge the invoice to be true and correct.

Signed: \_\_\_\_\_

For and on behalf of ECAS, LLC

Inspectors Stamp



## CERTIFICATE OF CONFORMITY

NO: 558133

**BILL TO:**

**DART AEROSPACE LTD.  
ACCTS. PAYABLE  
1270 ABERDEEN STREET  
HAWKESBURY, ON K6A1K7**

**SHIP TO:**

**DART AEROSPACE LTD.  
ATTN: RECEIVING  
1270 ABERDEEN STREET  
HAWKESBURY, ON K6A1K7**

CUSTOMER PO	SHIP DATE	AIRWAY BILL/TRACKING #
PO31952	4/7/2016	665770279800

PART NO:	Description	CND	QTY	S/L	
AN3-3A ✓ MFR: AFC LOT: 25270 ✓ AN3C13A ✓ MFR: AFC LOT: 23844 ✓ AN4-51A ✓ MFR: AFC LOT: 14474 ✓ CR3212-4-05 ✓ MFR: CHER LOT: 87856828 ✓ MS20004-24 ✓ MFR: HEAR LOT: 43036 ✓ MS20004-24 ✓ MFR: HEAR LOT: 30237 ✓ MS21042L06 ✓ MFR: AFC LOT: 19141 ✓	BOLT UNDRILLED  BOLT UNDRILLED S/S  BOLT UNDRILLED  CHERRY RIVET  BOLT  BOLT  SELF LOCKING NUT	NE  NE  NE  NE  NE  NE	100 ✓  20 ✓  24 ✓  100 ✓  5 ✓  5 ✓  100 ✓	54  19  15  43  6  5  44	

**CONDITIONS:    NE - New    OH-OVERHAULED    RP-REPAIRED    SV-SERVICEABLE**

We hereby certify that the items that are a part of this Purchase Order have been visually & dimensionally found to conform to all applicable standards, drawings & specifications. The liability of ECAS, LLC is limited to replacement of any item which is rejected because of a defect in material or workmanship if notified within 30 days & liability shall not exceed the invoice value. Such replacement shall constitute satisfaction of all liability.

SIGNED: \_\_\_\_\_

*For and on behalf of ECAS, LLC dba MONROE AEROSPACE*

**Insp.  
#2**

INSPECTOR'S STAMP

**ECAS, LLC dba MONROE AEROSPACE  
399 EAST DRIVE MELBOURNE, FL 32904 PH: 800.330.3975**



## CERTIFICATE OF CONFORMITY

NO: 558133

**BILL TO:**

DART AEROSPACE LTD.  
ACCTS. PAYABLE  
1270 ABERDEEN STREET  
HAWKESBURY, ON K6A1K7

**SHIP TO:**

DART AEROSPACE LTD.  
ATTN: RECEIVING  
1270 ABERDEEN STREET  
HAWKESBURY, ON K6A1K7

CUSTOMER PO	SHIP DATE	AIRWAY BILL/TRACKING #
PO31952	4/7/2016	665770279800

PART NO:	Description	CND	QTY	S/L
MS27039-1-24 ✓ MFR: LFC LOT: 51034 ✓ MS29512-06 ✓ MFR: PARK LOT: 0080235706 ✓ MS21250-06018 ✓ MFR: HEAR LOT: 41771	STRUCTURAL SCREW  O'RING  BOLT	NE  NE  NE	100  20  12	21  42  17

*Sold out*

CONDITIONS: NE - New OH-OVERHAULED RP-REPAIRED SV-SERVICEABLE

We hereby certify that the items that are a part of this Purchase Order have been visually & dimensionally found to conform to all applicable standards, drawings & specifications. The liability of ECAS, LLC is limited to replacement of any item which is rejected because of a defect in material or workmanship if notified within 30 days & liability shall not exceed the invoice value. Such replacement shall constitute satisfaction of all liability.

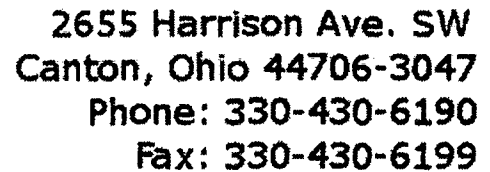
SIGNED: \_\_\_\_\_

For and on behalf of ECAS, LLC dba MONROE AEROSPACE

**Insp.**  
**#2**

INSPECTOR'S STAMP

ECAS, LLC dba MONROE AEROSPACE  
399 EAST DRIVE MELBOURNE, FL 32904 PH: 800.330.3975



## EAST COAST AVIATION

### Quality Assurance Representative

**WM. DENT**

[illegible]



# AIRFASCO

## INDUSTRIES

MANUFACTURER OF AEROSPACE PRODUCTS

2655 HARRISON AVE. SW  
CANTON, OH 44706  
PHONE: (330)430-6190  
FAX: (330)430-6199

### PHYSICAL AND CHEMICAL CERTIFICATION

DATE MFG.: 08/03/07

PART NO.: AN4-51A per NASM4-51A rev. 1

AFC LOT NO.: 14474

QTY MFG.: 19,973

PROCUREMENT SPECIFICATION: Produced per NASM 6812 rev. 2

### HEAT TREAT

VENDOR: Brite Metal

CERTIFICATION NO.: B-135362

PROCUREMENT SPECIFICATION: Heat Treat per MIL-H-6875 H

### PLATING

VENDOR: Beringer Plating

CERTIFICATION NO.: 45271

PROCUREMENT SPECIFICATION: Cadmium Plate per QQ-P-416, Type II, Class 2.F

### MATERIAL

MILL: Ivaco

COUNTRY OF MELT: Canada

HEAT: A85463

GRADE SPECIFICATION: Alloy Steel per AMS 6300 E, Type 4037, .275"

4037 MATERIAL CHEMISTRY											
ELEMENT-ID.	-C-	-MN-	-P-	-S-	-SI-	-NI-	-CR-	-MO-	-CU-	-AL-	Other
LADLE	.370	.790	.010	.008	.210	.030	.090	.219	.090	.005	

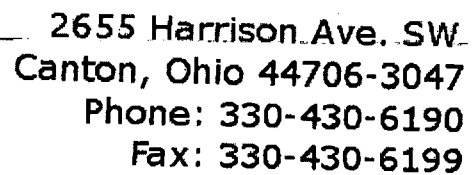
PHYSICAL PROPERTIES				
PHYSICAL	TENSILE	YIELD	SHEAR	HARDNESS
REQUIRED	4,080 lbs.	3,130 lbs.	3,680 lbs.	HRC 26-32
ACTUAL	5,316 lbs.	4,777 lbs.	4,240 lbs.	HRC 29-31

We hereby certify that the above data is correct and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries

Quality Assurance Representative:

T. West



# ECAS

**Quality Assurance Representative**

[illegible]



2655 Harrison-Ave. SW  
Canton, Ohio 44706-3047  
Phone: 330-430-6190  
Fax: 330-430-6199

**PHYSICAL AND CHEMICAL CERTIFICATION**

DATE MFG.: 05/20/15 PART NO.: AN3-3A per NASM3-3A rev.3  
AFC LOT NO.: 25270 QTY MFG.: 142,000  
PROCUREMENT SPECIFICATION: Produced per NASM 6812

**HEAT TREAT**

VENDOR: Brite Metal CERTIFICATION NO.: 169347  
PROCUREMENT SPECIFICATION: Heat Treat per AMS 2759

**PLATING**

VENDOR: Cleveland Plating CERTIFICATION NO.: 61872  
PROCUREMENT SPECIFICATION: Cadmium Plate per QQ-P-416 C, Type II, Class 2

**MATERIAL**

MILL: Solon Wire COUNTRY OF MELT: USA HEAT: 5170096  
GRADE SPECIFICATION: Alloy Steel per AMS 6300 E, Type 4037, .218"

**4037 MATERIAL CHEMISTRY**

ELEMENT-ID.	-C-	-MN-	-P-	-S-	-SI-	-NI-	-CR-	-MO-	-CU-	-AL-	Other
LADLE	.390	.830	.006	.005	.200	.040	.009	.230	.060	.021	

**PHYSICAL PROPERTIES**

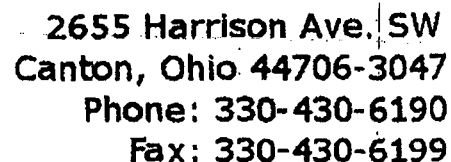
PHYSICAL	TENSILE	YIELD	SHEAR	HARDNESS
REQUIRED	2,210 lbs.	1,690 lbs.	2,125 lbs.	HRC 26-32
ACTUAL	3,947 lbs.	3,020 lbs.	2,721 lbs.	HRC 29-30

We hereby certify that the above data is correct and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

QS-082  
REV 0  
2/15

Airfasco Industries  
Quality Assurance Representative:

T. West



**ECAS LLC.**

**Quality Assurance Representative**

  
WM. DENT

[illegible]



2655 Harrison Ave. SW  
Canton, Ohio 44706-3047  
Phone: 330-430-6190  
Fax: 330-430-6199

**PHYSICAL AND CHEMICAL CERTIFICATION**

DATE MFG.: 01/29/14 PART NO.: AN3C13A per NASM3C13A rev. 3  
AFC LOT NO.: 23844 QTY MFG.: 42,200  
PROCUREMENT SPECIFICATION: Produced per NASM 6812

**HEAT TREAT**

VENDOR: Bodycote CERTIFICATION NO.: 38-41353  
PROCUREMENT SPECIFICATION: Heat Treat per AMS 2759

**PLATING**

VENDOR: AFC CERTIFICATION NO.: 14-23844  
PROCUREMENT SPECIFICATION: Passivate per AMS 2700, Method 2, QQ-P-35

**MATERIAL**

MILL: Carpenter COUNTRY OF MELT: USA HEAT: 557535  
GRADE SPECIFICATION: Stainless Steel per AMS 5628 F. Type 431 SS, .186"


431 SS MATERIAL CHEMISTRY											
ELEMENT-ID.	-C-	-MN-	-P-	-S-	-SI-	-NI-	-CR-	-MO-	-CU-	-Other-	Other
LADLE	.150	.590	.016	.001	.420	1.90	15.80	.030	.110		

PHYSICAL PROPERTIES				
PHYSICAL	TENSILE	YIELD	SHEAR	HARDNESS
REQUIRED	2,210 lbs.	1,690 lbs.	2,125 lbs.	HRC 28-32
ACTUAL	3,952 lbs.	3,086 lbs.	2,726 lbs.	HRC 28-30

We hereby certify that the above data is correct and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

QS-082  
REV 0  
2/15

Airfasco Industries  
Quality Assurance Representative:

  
T. West

2655 Harrison Ave. SW  
Canton, Ohio 44706-3047  
Phone: 330-430-6190  
Fax: 330-430-6199

## CERTIFICATE OF CONFORMANCE

## EAST COAST AVIATION

I Hereby Certify that on 09/29/14 Airfasco Industries provided the supplies called for by Contract/ PO Number 72763 in accordance with all applicable requirements for shipment. I further state that the process certifications are in conformance with the contract requirements, including specifications and/or drawings, physical item identification (part number) and the quantity shown on this or attached acceptance document. The part numbers certified below have been manufactured in the United States. DFAR 252.225-7009 compliant in fastener base raw material melt source only, with heat number and country, does not include the post cadmium metal plating.

**Quality Assurance Representative**

  
WM. DENT

[illegible]



# AIRFASCO

## INDUSTRIES

MANUFACTURER OF AEROSPACE PRODUCTS

2655 HARRISON AVE. SW  
CANTON, OH 44706  
PHONE: (330)430-6190  
FAX: (330)430-6199

### PHYSICAL AND CHEMICAL CERTIFICATION

DATE MFG.: 08/03/07 PART NO.: AN4-51A per NASM4-51A rev. 1  
AFC LOT NO.: 14474 QTY MFG.: 19,973  
PROCUREMENT SPECIFICATION: Produced per NASM 6812 rev. 2

### HEAT TREAT

VENDOR: Brite Metal CERTIFICATION NO.: B-135362  
PROCUREMENT SPECIFICATION: Heat Treat per MIL-H-6875 H

### PLATING

VENDOR: Berlinger Plating CERTIFICATION NO.: 45271  
PROCUREMENT SPECIFICATION: Cadmium Plate per QQ-P-416, Type II, Class 2.F

### MATERIAL

MILL: Ivaco COUNTRY OF MELT: Canada HEAT: A85463  
GRADE SPECIFICATION: Alloy Steel per AMS 6300 E, Type 4037, .275"

#### 4037 MATERIAL CHEMISTRY

ELEMENT-ID.	-C-	-MN-	-P-	-S-	-SI-	-NI-	-CR-	-MO-	-CU-	-AL-	Other
LADLE	.370	.790	.010	.008	.210	.030	.090	.219	.090	.005	

#### PHYSICAL PROPERTIES

PHYSICAL	TENSILE	YIELD	SHEAR	HARDNESS
REQUIRED	4,080 lbs.	3,130 lbs.	3,680 lbs.	HRC 26-32
ACTUAL	5,316 lbs.	4,777 lbs.	4,240 lbs.	HRC 29-31

We hereby certify that the above data is correct and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries

Quality Assurance Representative: T. West  
T. West

AIRFASCO INDUSTRIES QUALITY CONTROL FORM 1011B

CIF4-0



# CHERRY® AEROSPACE

SPS Fastener Division, a PCC Company

Cherry Aerospace  
1224 East Warner Avenue  
Post Office Box 2157  
Santa Ana, CA 92707-0157  
USA



## PACKING LIST

Order No: SO375048  
Order Date: 03/13/13  
Print Date: 10/31/13

Page: 1



Sold-To: 10016384

Ship-To: 10016384

S O L D T O	PEERLESS AEROSPACE FAST
	141 EXECUTIVE BLVD.
	PO BOX 710
	FARMINGDALE, NY 11735
	USA

S H I P T O	PEERLESS AEROSPACE FAST
	141 EXECUTIVE BLVD.
	PO BOX 710
	FARMINGDALE, NY 11735
	USA

Salesperson (s):113

Purchase Order: PURC1424

Credit Terms: P10  
DUE 03/28/14

Ship Via: YRC  
FOB: Origin - Collect

### Remarks:

SHIPMENTS 100 - 400 LBS. GO UPS GROUND COLLECT ACCOUNT# 148984  
SHIPMENTS 400 + LBS GO YRC (YELLOW/ROADWAY) BOL COLLECT TO PAF

\*\*\*\*\*  
DO NOT INSURE. PAF's PO# MUST BE REFERENCED. ANY SPECIAL SERVICE USED FOR  
URGENT PO REQUIREMENTS MUST BE AUTHORIZED. UNAUTHORIZED CHARGES WILL BE  
RE-BILLED OR DEBITED BACK TO SHIPPER.  
\*\*\*\*\*

BRITISH AEROSPACE APPROVAL# BAe/AG/30158/MAA to BAe/AG/QC/SC1 PART 3  
AIRBUS APPROVAL# 30114

**TEST REPORTS ENCLOSED**

ECCN: EAR99

**DO NOT DESTROY...**

\*IF APPLICABLE, PART MEETS DFARS CLAUSE 252.225-7009 ALT I

\*PREFERENCE FOR DOMESTIC SPECIALTY METALS

SHIP UPS GROUND COLLECT, ACCOUNT #795-1E0

ECCN: EAR99

SHIPMENTS OVER 150# SHIP VIA ABF ACCOUNT # 233589-075D

Unless otherwise specified on this order, Cherry will manufacture and  
certify parts to the part number's latest revision. Latest revisions are  
shown at <https://bizpartner.cherryaerospace.com/partrevisions.htm> under  
"Part Number Revision List".

Ln	Item Number	Site T Location/Lot/Serial	Qty Open Qty to Ship	UM	Promised Shipped
3	CR3212-4-05 Customer Item: NAS9302B-4-05 ASNA0077A405 B0207003-4-05 CAN43076B4-5 M7885/3-4-05	1600		EA	03/06/14*

These commodities, technology or software were exported from the United States in accordance with the Export Administration Regulations. Diversion contrary to US law is prohibited

### CERTIFICATION

### ATTENTION: PURCHASING DEPARTMENT

### Quality Assurance Representative

The material and/or parts we are furnishing in this shipment (as shown above) on the subject Purchase Order conform to the order and applicable specifications. Evidence that the material and/or parts meet the specifications and results of all tests for each lot affected will be in our files and will be available for your inspection at any reasonable time.

Signed  
**SIM NGUYEN**



**CHERRY®**  
AEROSPACE  
SPS Fastener Division, a PCC Company

Cherry Aerospace  
1224 East Warner Avenue  
Post Office Box 2157  
Santa Ana, CA 92707-0157  
USA



# PACKING LIST

Order No: SO375048  
Order Date: 03/13/13  
Print Date: 10/31/13

Page: 2

Sold-To: 10016384

Ship-To: 10016384

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PEERLESS AEROSPACE FAST  
141 EXECUTIVE BLVD.  
PO BOX 710  
FARMINGDALE, NY 11735  
USA

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PEERLESS AEROSPACE FAST  
141 EXECUTIVE BLVD.  
PO BOX 710  
FARMINGDALE, NY 11735  
USA

Ln	Item Number	Site T Location Lot/Serial	Qty Open Qty to Ship	UM	Promised Shipped
3	CR3212-4-05 MBBN3013L3205 NAS9302BNS-4-05				
	1 B0702 87837083		3300.0	( )	
	1 EZLINE-3 87856828		33962.0	( )	
	1 F0904 87832902		8975.0	( )	
	1 F0905 87835650		3765.0	( )	

**TEST REPORTS ENCLOSED**  
**DO NOT DESTROY**



These commodities, technology or software were exported from the United States in accordance with the Export Administration Regulations. Diversion contrary to US law is prohibited

## CERTIFICATION

## ATTENTION: PURCHASING DEPARTMENT

## Quality Assurance Representative

The material and/or parts we are furnishing in this shipment (as shown above) on the subject Purchase Order conform to the order and applicable specifications. Evidence that the material and/or parts meet the specifications and results of all tests for each lot affected will be in our files and will be available for your inspection at any reasonable time.

Signed  
**SIM NGUYEN**

**CHERRY AEROSPACE**1224 East Warner Avenue  
Santa Ana, CA 92707-0157Accredited Chemical Processing  
Heat Treating  
ISO/IEC 17026  
Material Testing Lab**Final Inspection & Test Report****CherryMax® Rivet**

An ISO9001 and AS9100 registered company. OASIS #6111041608

Part Numbers	Rev	Proc. Spec.	Rev	<b>Lot I.D. No.: 87856828</b>  <b>Lot Size: 34,300</b>  <b>MFG. Date: September 09, 2013</b>
CR3212-4-05	AD	PS-CMR-3000	R	
CR3212PR-4-05	AD	PS-CMR-3000	R	
** See 2nd Page for the Customer Parts				

**ASSEMBLY DATA**

TYPE	ID #	CERT #	MATERIAL	FINISH	LUBE
Rivet	87819320	A73030	QQ-A-430/5056	MIL-C-5541 CLEAR CL1A	None
Stem	87802907	A73261	AMS6322 / 8740ST	QQ-P-418/T2CL2/CAD PL	AS5272, Type 1, Moly Disulfide
Collar	00000000	A73231	A-286 / AMS5731	Passivate per AMS2700	None

W.O. #: 5528437

Final Lube: None

**QUALITY CONFORMANCE/ACCEPTANCE RESULTS**

MIN REQ'D SAMPLE SIZE SPECS	INSTALLED SHEAR		TENSION		SPINDLE RETENTION		DISASSEMBLY
	664		285		125		10
	8	N/A	8	N/A	8	N/A	5
	C-N-M	B	C-N-M	B	C-N-M	B	C-N-M
RESULTS	859		370		375		68
	859		415		277		55
	847		380		253		88
	854		388		229		51
	859		388		241		100
C=CR N=NAS	891		393		391		
M=MIL B=BAC	851		405		231		
LOAD VALUES	875		377		268		
IN POUND							

PCS.	ITEM	STATUS	PCS.	ITEM	STATUS
20	EXAMINATION	PASS	20	INSTALLATION (Min and Max Grips)	PASS

**Comments:**

Blind Fastener

Tr. Rev: -	Q Code
Rev. Date: 8/9/2013	V09
Inspector D Rice	

The parts contained in this shipment have been manufactured and inspected in accordance with TSO-C148. The conditions and tests required for TSO approval of this article are minimum performance standards. Aircraft fasteners approved under this TSO are not necessarily interchangeable with other aircraft fasteners approved under this TSO. Fasteners of similar dimensional properties may have widely varying performance and metallurgical properties. Substitution of parts may only be done if acceptable to or approved by the Administrator.

This test report shall not be reproduced except in full, without the written approval of the laboratory.  
The recording of false, fictitious, or fraudulent statement or entries on the certificate may be punished as a felony under Federal law.

Form No. 1141-10-75 Rev. F 07/15/10 CR10-0832



Page 1 of 2



**CHERRY<sup>®</sup> AEROSPACE**  
THE AIRCRAFT MANUFACTURING COMPANY

1224 East Warner Avenue  
Santa Ana, CA 92707-0157



Accredited

**Nadcap**

Chemical Processing  
Heat Treating  
ISO/IEC 17025  
Material Testing Lab

## Final Inspection & Test Report CherryMax<sup>®</sup> Rivet

An ISO9001 and AS9100 registered company. OASIS #6111041606

### Customer Parts List

Lot I.D. No.: **87856828**

Rev: -

<u>Customer Part Number</u>	<u>Rev</u>	<u>Proc. Spec.</u>	<u>Rev</u>
NAS9302BNS-4-05	5	NAS1686	3
ASNA0077A405	N	MIL-R-7885	D2
ASNA0077A405	N	NAS1686	3
ASNA0077A405	N	PS-CMR-3000	R
B0207003-4-05	B	MIL-R-7885	D2
B0207003-4-05	B	NAS1686	3
B0207003-4-05	B	PS-CMR-3000	R
CAN43076B4-5	8	MIL-R-7885	D2
CAN43076B4-5	8	NAS1686	3
CAN43076B4-5	8	PS-CMR-3000	R
M7885/3-4-05	C2	MIL-R-7885	D2
MBBN3013L3205	01/08	MBBN3015	12/03
NAS9302B-4-05	5	NAS1686	3

Parts delivered in accordance with the standard amendments as agreed by Cherry/EADS.



# CERTIFIED INSPECTION REPORT AND TEST RESULTS

## KAISER ALUMINUM

1547 Helton Drive - Florence, AL 35630

### SHIP TO:

CHERRY AEROSPACE,SPS TECH LLC  
1224 EAST WARNER AVENUE  
SANTA ANA, CA 92707-0157  
SANTA ANA, CA 92707-0157

### SOLD TO:

CHERRY AEROSPACE,SPS TECH LLC  
ATTN ACCTS PAYABLE  
P. O. BOX 2157  
SANTA ANA, CA. 92707-0157

Customer PO Number PO152327		NW WORK ORDER NO. 11502		<i>Dana Harkin</i>	
DESCRIPTION 123 5056 H32 STEM				AUTHORIZED SIGNATURE QUALITY CONTROL MANAGER	
CUSTOMER PART NO.	ALLOY 5056	TEMPER H32		We hereby certify that the material covered by this report has been inspected in accordance with, and has been found to meet, the applicable requirements described herein, including any specifications forming a part of the description, and that samples representative of the material met the composition limits and had the mechanical properties shown on this sheet.	
NW PART NO. H123A7		DATE SHIPPED 5/6/2013			
WEIGHT SHIPPED 1,699					

LOT NUMBER	# OF TESTS	ULTIMATE		YIELD		% ELONGATION	
		STRENGTH K.S.I.		STRENGTH K.S.I.			
		Min	Max	Min	Max		
K850440	2	48.6	48.8				

COMMENTS:  
M005.123 REV T  
QQA-430C  
MILL SOURCE KAISER  
MADE IN USA

  
MAY 14 2013



A73030

CHEM COMP	ALLOY	SILICON		IRON		COPPER		MANGANESE		MAGNESIUM		CHROMIUM		OTHERS	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
	5056		0.30		0.40		0.10	0.05	0.20	4.50	5.80	0.05	0.20	0.05	0.15
		NICKEL		ZINC		TITANIUM		LEAD		BISMUTH					
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
					0.10										
ALUMINUM REMAINDER															



# **CERTIFIED INSPECTION REPORT AND TEST RESULTS**

## **KAISER ALUMINUM**

1547 Helton Drive • Florence, AL 35630

**SHIP TO:**

CHERRY AEROSPACE,SPS TECH LLC  
1224 EAST WARNER AVENUE  
SANTA ANA, CA 92707-0157  
SANTA ANA, CA 92707-0157

**SOLD TO:**

CHERRY AEROSPACE,SPS TECH LLC  
ATTN ACCTS PAYABLE  
P. O. BOX 2157  
SANTA ANA, CA. 92707-0157

Customer PO Number PO152327		NW WORK ORDER NO. 11502		<i>Dave Haldin</i>	
DESCRIPTION .123 5056 H32 STEM				AUTHORIZED SIGNATURE QUALITY CONTROL MANAGER	
CUSTOMER PART NO.	ALLOY 5056	TEMPER H32		We hereby certify that the material covered by this report has been inspected in accordance with, and has been found to meet, the applicable requirements described herein, including any specifications forming a part of the description, and that samples representative of the material met the composition limits and had the mechanical properties shown on this sheet.	
NW PART NO. H123A7		DATE SHIPPED 5/6/2013			
WEIGHT SHIPPED 1,699					

LOT NUMBER	# OF TESTS	ULTIMATE		YIELD		% ELONGATION	
		STRENGTH K.S.I.		STRENGTH K.S.I.			
		Min	Max	Min	Max		
K850440	2	48.6	48.8				

**COMMENTS:**

M005.123 REV T  
QQA-430C  
MILL SOURCE KAISER  
MADE IN USA

  
 MAY 14 2013

A73030  
 Kaiser Aluminum Fabricated  
 K850440

CHEM COMP	ALLOY	SILICON		IRON		COPPER		MANGANESE		MAGNESIUM		CHROMIUM		OTHERS	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
	5056		0.30		0.40		0.10	0.05	0.20	4.50	5.80	0.05	0.20	0.05	0.15
		NICKEL		ZINC		TITANIUM		LEAD		BISMUTH					
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
					0.10										
ALUMINUM REMAINDER															





**Kaiser Aluminum Fabricated Products, LLC**  
**600 Kaiser Drive**  
**Heath, OH 43056-1088**  
**740-522-1151**

Test Code: 4000 Actual Physical Properties

**Lot No.**

850440 0.0

Lot	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti
Cast/Drop								
ChemID								

850440									
48-3F2	Act.	0.04	0.09	0.01	0.07	4.7	0.06	0.02	0.02
177354									

Chemical Limits	Min				0.05	4.5	0.05		
	Max	0.30	0.40	0.10	0.20	4.9	0.20	0.10	0.05
		Others	Each	0.05	Max		Total	0.15	Max

377  
AUDIT

QQA-430 REV C

Kaiser Aluminum Fabricated  
K350460

**A73030**

MAY 14 2013

Plant Serial: 28663  
Kaiser Order Number: 624551218  
Line Item: 1

**KAISER  
ALUMINUM  
FABRICATED PRODUCTS**

Kaiser Aluminum Fabricated Products, LLC  
800 Kaiser Drive  
Heath, OH 43058-1088  
740-522-1151

*Best in Class*

Revised Certification  
**CERTIFIED TEST REPORT**  
<http://Online.KaiserAluminum.com>

**Miscellaneous Notes**

Made in USA

Product produced from K540 meets the requirements of aluminum alloy 5056. Mercury is not a normal contaminant in aluminum alloys. Neither mercury nor any of its compounds were utilized by Kaiser Aluminum in the manufacture of this material. Actual (Act) chemical composition is from representative samples taken during the ingot casting process. Independent chemical analysis will vary from these values because of natural variation in the process and testing error. This test report shall not be reproduced, except in full, without the written approval of Kaiser Aluminum. The recording of false, fictitious, or fraudulent statements or entries on the certificate may be punished as a felony under federal law. Chemical analysis performed in accordance with ASTM E 1251-11. The Newark facility is AS9100C:2009 approved. The Newark Laboratory is NADCAP approved for chemical testing (OES).

**CERTIFICATION**

Kaiser Aluminum Fabricated Products, LLP ("Kaiser") hereby certifies that metal shipped under this order has been inspected and tested and found in conformance with the applicable specifications forming a part of the description set forth in Kaiser's sales order acknowledgement form. Any warranty is limited to that shown on Kaiser's standard general terms and conditions.

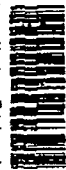
Warren Marcucci, Technical Manager

*Warren Marcucci*



MAY 14 2013

Kaiser Aluminum Fabricated Products  
K54040



A73030



Plant Serial: 28663  
Kaiser Order Number: 624551218  
Line Item: 1



# WireTech, Inc.

6440 E. Canning Street  
Los Angeles, CA 90040  
Phone (323) 722-4933  
Fax (323) 721-2738

SOLD TO

CHERRY AEROSPACE LLC  
1224 E. WARNER AVENUE  
SANTA ANA, CA 92705-5414  
USA

## CERTIFICATION

WORK ORDER  
100158

HEAT NO.  
10234411  
SALES ORDER / RLS  
850392 / 1  
ISO 9001:2000 REGISTERED



MECHANICAL TESTING  
CERT # 911.01

CERT# 911.01

CUSTOMER P.O. VP201301	CUSTOMER PART m272.1040	QUANTITY 3,184 Lbs	CARRIERS 4	LADING NO 00104539	SHIPMENT DATE 06/25/2013			
<b>SPECIFICATION C208740-101040A</b> <b>A-8740, AQ, SKFG, CHQ WIRE, SEAM &amp; DEARB FREE, SAIP Zinc Phosphate, Lime &amp; Stearate Coating,</b> <b>Size:0.1035/0.1045 Specifications: AMS 2301K, AMS6322N, MIL-S-6049A, AMEND1, ASTM-A-547, AMS-S-6049-A,</b> <b>M 272.1040 REV. T</b>								
<b>CERTIFICATION REQUIREMENTS</b>								
<b>Chemical Properties</b>								
C	Si	Mn	P	S	Cu	Ni	Cr	Mo
.39	.23	.85	.009	.007	.08	.43	.52	.21
<b>Physical Properties</b>								
Grain Size	Jominy 1	Jominy 2	Jominy 3	Inclusions	Macro	Cleanliness	Mill Source	
6 J5=53	J8=46	J10=43	S2-R1-C2	GOOD	F&S=0	Charter		
Country of Origin USA - DFAR Compliant								
<b>Mechanical Properties</b>								
TEST	UNITS	Results						
Tensile Strength	KSI	134.4						
Yield Strength	KSI	114.3						
% Elongation	%	7						
% Reduction of Area	%	69.2						
Rockwell Hardness C Scale	HRC	29						
Decarb (Total)	In	0.00						

JUL - 2 2013

303 100158

REPRODUCTION OF THIS CERTIFICATION IS NOT ALLOWED UNLESS IN FULL.

Wire Tech, Inc. metallurgical laboratory is accredited in the following test chemical analysis per ASTM E 415, mechanical testing per ASTM A 370, Rockwell hardness per ASTM E 18, metallographic mount preparation per ASTM E 3, decarburization depth per ASTM E 1077, IFI 140, inclusion rating per ASTM E 45, decarburization performed as per IFI 140. The reported Chemical and Physical Properties are Mill Source results. Transcribed from mill certificates. HRB(W) are hardness results performed with a 1/16" carbide ball. Unless otherwise specified, HRB and HRC results are conversions from ASTM A370 tables 1 and 2. \*Test result not covered by our current A2LA accreditation. Tests which have been undertaken by a subcontractor laboratory that is not accredited are not endorsed by A2LA or covered by Wire Tech, Inc. A2LA accreditation.

TEST RESULTS RELATE ONLY TO THE ITEMS TESTED.

DFAR Material per Clauses 252.225-7014 ALT. 1, 252.225-7009, & 225.003(9)

"LATEST REVISIONS OF ASTM"

Material is free of mercury, radium, or alpha contamination.

A73261

*Garry Goodson*

CHARTER  
STEEL

CHARTER  
STEEL

EMAIL

1658 Cold Springs Road

Saukville, Wisconsin 53080

(262) 268-2400

1-800-437-8789

FAX (262) 268-2570

A Division of  
Charter Manufacturing Company, Inc.

CHARTER STEEL TEST REPORT  
Reverse Has Text And Codes

Wiretech Incorporated  
6440 East Canning Street  
Attn: Andre Stephan  
Los Angeles, CA-90040

Cust P.O.	6984-2
Customer Part #	8740C1A060-C-R
Charter Sales Order	70039158
Heat #	10234411
Ship Lot #	4193273
Grade	8740 R SK FG AQ 1/4
Process	HRSA
Finish Size	1/4

I hereby certify that the material described herein has been manufactured in accordance with the specifications and standards listed below and on the reverse side, and that it satisfies these requirements.

Test Results of Heat Lot# 10234411											
Lab Code: 7388	C	MN	P	S	SI	NI	CR	MO	CU	SN	V
CHEM	.38	.85	.008	.007	.230	.43	.52	.21	.08	.007	.003
%Wt											
	AL	N	B	TI	N8						
	.024	.0060	.0001	.001	.002						
JOMINY(HRC)	JOM01	JOM02	JOM03	JOM04	JOM05	JOM06	JOM07	JOM08	JOM09	JOM10	JOM12
	58	58	56	54	53	50	48	45	44	43	40
	JOM14	JOM16	JOM18	JOM20	JOM24	JOM28	JOM32				
	38	35	34	33	31	28	28				

A73261  
Wiretech-  
10234411

JOMINY SAMPLE TYPE ENGLISH = C  
MACRO ETCH SURFACE = 1 MACRO ETCH RANDOM = 1 MACRO ETCH CENTER = 1  
AMS 2301 FREQUENCY AVERAGE = .00 AMS 2301 FREQUENCY INDIVIDUAL = .00  
AMS 2301 SEVERITY AVERAGE = .00 AMS 2301 SEVERITY INDIVIDUAL = .00  
CHEM DEVIATION EXT.-GREEN =

JUL - 2 2013



Test Results of Rolling Lot# 1090025

REDUCTION RATIO = 616:1

Test Results of Processing Lot# 4193063, 4193273					TENSILE LAB = 0358-02 RA LAB = 0358-02 RB LAB = 0358-02
	# of Tests	Min Value	Max Value	Mean Value	
TENSILE	1,0	81.8	81.8	81.8	
REDUCTION OF AREA	1	69	69	69	
ROCKWELL B	1	80	80	80	

NUM DECARB = 1 FREE FERRITE DECARB = .000 FREE FERR & PARTIAL DECARB = .003  
CP SPHERO % LAB = 0358-02 NUM SPHERO = 1 SPHERODIZATION = 80.0

Specifications: Manufactured per Charter Steel Quality Manual Rev 8,08-01-09  
Meets customer specifications with any applicable Charter Steel exceptions for the following customer documents:  
Customer Document = AMS6322N/AMS2301K/COP3010M/BS2S147:1976 CHEM ONLY Revision = Dated =

Additional Comments:



Charter Steel  
Saukville, WI, USA



Page 1 of 1

This MTR supersedes all previously dated MTRs for this order

Janice Barnard  
Manager of Quality Assurance  
03/15/2013

Rem: Load1, Fax0, Mail0

The following statements are applicable to the material described on the front of this Test Report:

1. Except as noted, the steel supplied for this order was melted, rolled, and processed in the United States meeting DFAR's compliance.
2. Mercury was not used during the manufacture of this product, nor was the steel contaminated with mercury during processing.
3. Unless directed by the customer, there are no welds in any of the coils produced for this order.
4. The laboratory that generated the analytical or test results can be identified by the following key:

Certificate Number	Lab Code	Laboratory		Address
0358-01	7388	CSSM	Charter Steel Melting Division	1653 Cold Springs Road, Saukville, WI 53080
0358-02	8171	CSSR/CSSP	Charter Steel Rolling/Processing Division	1658 Cold Springs Road, Saukville, WI 53080
0358-03	123633	CSFP	Charter Steel Ohio Processing Division	6255 US Highway 23, Risingsun, OH 43457
0358-04	125544	CSCM/CSCR	Charter Steel Cleveland	4300 E. 49th St., Cuyahoga Heights, OH 44125-1004
.	.	--	Subcontracted test performed by laboratory not in Charter Steel system	

5. When run by a Charter Steel laboratory, the following tests were performed according to the latest revisions of the specifications listed below, as noted in the Charter Steel Laboratory Quality Manual:

Test	Specification	CSSM	CSSR/CSSP	CSFP	CSCM/CSCR
Chemistry Analysis	ASTM E415; ASTM E1019	X			X
Macroetch	ASTM E381	X			X
Hardenability (Jominy)	ASTM A255; SAE J406; JIS G055	X			X
Grain Size	ASTM E112	X	X	X	X
Tensile Test	ASTM E8; ASTM A370		X	X	X
Rockwell Hardness	ASTM E18; ASTM A370	X	X	X	X
Microstructure (Spheroidization)	ASTM A892		X	X	
Inclusion Content (Methods A, E)	ASTM E45		X		X
Decarburization	ASTM E1077		X	X	X

Charter Steel has been accredited to perform all of the above tests by the American Association for Laboratory Accreditation (A2LA). These accreditations expire 01/31/15.

All other test results associated with a Charter Steel laboratory that appear on the front of this report, if any, were performed according to documented procedures developed by Charter Steel and are not accredited by A2LA.

6. The test results on the front of this report are the true values measured on the samples taken from the production lot. They do not apply to any other sample.
7. This test report cannot be reproduced or distributed except in full without the written permission of Charter Steel. The primary customer whose name and address appear on the front of this form may reproduce this test report subject to the following restrictions:
  - It may be distributed only to their customers
  - Both sides of all pages must be reproduced in full
8. This certification is given subject to the terms and conditions of sale provided in Charter Steel's acknowledgement (designated by our Sales Order number) to the customer's purchase order. Both order numbers appear on the front page of this Report.
9. Where the customer has provided a specification, the results on the front of this test report conform to that specification unless otherwise noted on this test report.

JUL - 2 2013



A73261

# Certificate of Analysis

Radcliff Wire Inc. 97 Ronzo Rd., P.O. Box 603, Bristol, CT 06010

Date Shipped: 06/12/2013

PO #: VP125694

Qty. Shipped: 147 LBS-17 BLACK  
MIG SPOOLS

Radcliff No.: 128930

Heat No.: D5874

Customer: CHERRY AEROSPACE  
SANTA ANA OPERATIONS  
1224 EAST WARNER AVE  
SANTA ANA, CA 92705-5414

Country of Origin: USA

Original Mill Source: USA

Size: .006 X .011 X .056 \*\*\*

Material: A286 Stainless Steel

Description: SPECIAL SHAPE

Specification: AMS 5731 REV L, AMS 5737 REV P  
CHEM ONLY

## Chemical Properties

Al: 0.24%	B: 0.0072%	Bi: <0.00001%	C: 0.034%	Co: 0.06%
Cr: 14.13%	Cu: 0.07%	Fe: BAL%	Mn: 0.14%	Mo: 1.21%
Ni: 24.79%	P: 0.008%	Pb: 0.0001%	S: 0.001%	Si: 0.12%
Ti: 2.16%	V: 0.27%			

## Notes:

DFAR COMPLIANT  
PART# M189.44 REV W  
CONSIGNMENT ORDER

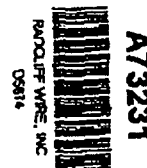
Tensile: 98 KSI

Rockwell:

Certs/Material



7.15.13



Lisa Platek  
Certification Clerk

The material as shipped is free from mercury contamination



613-267-3762 FAX 613-267-5617  
 818-833-9632 FAX 818-833-2213  
 870-882-2980 FAX 870-381-6888  
 803-283-3363 FAX 803-283-6303



Creating an innovation  
 central wire products

FOND DU LAC, WI  
 UNION, IL  
 PERRIS, CA

820-826-0609 FAX 820-826-0882  
 815-823-2131 FAX 815-823-2128  
 951-857-2106 FAX 951-943-6061

THE LEADING MANUFACTURER OF STAINLESS STEEL AND NICKEL ALLOY WIRE PRODUCTS  
 EXECUTIVE OFFICES: PERTH, ON CANADA - EMAIL: [sales@centralwire.com](mailto:sales@centralwire.com)

CENTRAL WIRE  
 8509 OLSON ROAD  
 TEL: 818-823-2131

UNION, IL 60180-9730  
 FAX: 815-823-2126

## CERTIFICATE OF CONFORMANCE

SOLD  
TO

RADCLIFF WIRE INC.  
 P. O. BOX 603  
 BRISTOL  
 USA

CT 06011-0603

SHIP  
TO

RADCLIFF WIRE INC.  
 97 RONZO ROAD  
 BRISTOL,  
 USA

CT 06011-0603

CUSTOMER'S PO NO.	TYPE OF CERT	CUSTOMER	ORDER NO.	WORK ORDER	DATE SHIPPED
46499	Customer	124610	1181606 2	4143739	4/04/13
SPECIFICATIONS:					

ITEM DESCRIPTION		
DESCRIPTION	SPEC. CLASS	HEAT
Forming A286SF SKIN PASSED Bright .0300 200LB.Plus Clean		D5874
	QTY SHIP 157	044

CHEMICAL ANALYSIS						
C .034	MN .14	SI .12	P .009	S < .001	CR 14.13	NI 24.79
MO 1.21	CU .07	CO .06	AL .24	TI 2.16	FE Balance	B .0072
V .27	BI < .00001	PB < .0001				

MECHANICAL PROPERTIES							
AS SHIPPED PROPERTIES:							
TENSILE 114.000 KSI MIN	TENSILE 115.000 KSI MAX						
AFTER HEAT TREAT PROPERTIES:							

"PASSIVATED IN PROCESS"

The material as shipped is free from mercury contamination. I certify the chemical analysis and physical and mechanical test results reported above are correct as contained in the records of the company.

Very truly yours,



7.15.13



A73231

*David Mery*  
 AUTHORIZED SIGNATURE

Latrobe Specialty Steel Company  
2626 S. Ligonier St  
Latrobe, PA 15650

## CERTIFICATE OF TEST

Production Order Number		Wgt. Shipped	Sales Order No.	Heat No.
10379207-01-01		12877	20168995-01	D5874
Customer Order No./Req'n. No.			Delivery Number	
2009740			30406653	

Bill To: 502026

CENTRAL WIRE  
TECHALLOY UNION  
6509 OLSON ROAD  
UNION, IL 60180  
USA

Ship To: 407182

CENTRAL WIRE FOND DU LAC  
1795 SOUTH HICKORY STREET  
FOND DU LAC, WI 54937  
USA

### Material Description:

(TO SIZE) .343 RND COIL LS-A286 VAR HR CENTRAL WIRE D.3.PRS.010.S REV A EXCEPT AS RECEIVED UTS 110 KSI MAX, D.3.PRS.008.S REV F EXCEPT 300# MINIMUM COIL WEIGHT & .008" MAX DEFECT DEPTH, 10 CFR CH. I (1-1-08 EDITION) PART 21 - REPORTING OF DEFECTS & NONCOMPLIANCE INQOT #1

### Chemical Analysis Wt%:

C	Si	Mn	S	P	B	Cr	V	Ni	Mo	Co	Cu	Ti	Al	Fe
.034	.12	.14	<.001	.009	.0072	14.13	.27	24.79	1.21	.06	.07	2.16	.24	Bal.

Pb Bi  
<.0001 <.00001

Bismuth (Bi) and lead (Pb) were tested at Laboratory Testing Inc., Report number TLS001-11-06-21041-1, TLS001-11-06-21360-1 & TLS001-11-06-20812-1.

### As Received:

Ultimate Tensile Strength per ASTM E8-09 & ASTM A370-11: 98.5 KSI

This test was performed at Product Evaluation Systems, Inc., LTB Report No. 49713.

Grain Size per ASTM E-112-10: 9.5

Capability Heat Treatment: 1650°F (2 hrs) WQ + 1325°F (16 hrs) AC

Room Temperature Tensile Test per ASTM E8-09 & ASTM A370-11:

Longitudinal center at .343" Rnd.

ID	UTS (ksi)	0.2YS (ksi)	El (%in4d)	R.A. (%)	HRC
UF	165.3	112.4	24	47	37

This test was performed at Westmoreland Mechanical Testing & Research, Inc., Report No. 1-70188.

Combination Stress Rupture per ASTM E292-09:

ID	Temp (°F)	Stress (ksi)	El (%in4d)	Rupture Life (hrs)*	Rupture Location
UG	1200	65	45.7	69.2	Smooth

\*Upload after 48 hrs./ 5 KSI/ every 8-10 hrs.; final stress 75 KSI

This test was performed at Westmoreland Mechanical Testing & Research, Inc., Report No. 1-70188.

Grain Size per ASTM E-112-10: 9

Testing methods for chemical analysis tested at Latrobe Specialty Steel are as follows: C, S, N, O & H - Combustion; Si, Mn, W, Cr, V, Mo, Cu, Co, Al >1%, Ti >1%, Ca, Ta, Fe & Sn - X-Ray. Balance of elements analyzed on OES. Other testing methods not listed above have been conducted per certified material specification(s).

Latrobe Specialty Steel Company is registered to Quality Management System Standards: ISO 9001 and AS9100.

Need certs? Our air melt certs are available online at <http://www.latrobesteel.com>

We certify this material to have been manufactured, inspected, and tested, and found the results to conform to all drawing and specification requirements and order requirements as applicable. The recording of false, fictitious or fraudulent statements or omissions on the documents may be punishable as a felony under Federal Statute. This certificate or report shall not be reproduced except in full, without the written approval of Latrobe Specialty Steel Company.

Page 1 of 2

Inspection Department  
Paula M. Platt - Sr. Metallurgical Certification Coordinator

Date

08/29/11

A73231  
RACCLIFF WIRE, INC. -  
D5874

REC'D APR 11 2013

7.15.13



Latrobe Specialty Steel Company  
2626 S. Ligonier St.  
Latrobe, PA 15650

## CERTIFICATE OF TEST

Production Order Number		Wgt. Shipped	Sales Order No.	Heat No.
10379207-01-01		12877	20168995-01	D5874
Customer Order No./Req'n. No.			Delivery Number	
2009740			30406653	

Bill To: 502026

CENTRAL WIRE  
TECHALLOY UNION  
6509 OLSON ROAD  
UNION, IL 60180  
USA

Ship To: 407182

CENTRAL WIRE FOND DU LAC  
1795 SOUTH HICKORY STREET  
FOND DU LAC, WI 54937  
USA

### Material Description:

(TO SIZE) 343 RND COIL LS-A286 VAR HR CENTRAL WIRE D.3.PRS.010.S REV A EXCEPT AS RECEIVED UTS 110 KSI MAX, D.3.PRS.008.S REV F EXCEPT 300# MINIMUM COIL WEIGHT & .005" MAX DEFECT DEPTH, 10 CFR CH. I (1-1-08 EDITION) PART 21 - REPORTING OF DEFECTS & NONCOMPLIANCE INGT#1

Capability Heat Treatment: 1800°F (1 hr) WQ + 1325°F (16 hrs) AC

Room Temperature Tensile Test per ASTM E8-09 & ASTM A370-09:

Longitudinal center at .343" Rnd.

ID	UTS(ksi)	0.2TYS(ksi)	El(%in4d)	R.A.(%)	HRC
UI	162.2	106.3	26	54	36

This test was performed at Westmoreland Mechanical Testing & Research, Inc.,  
Report No. 1-70189.

Combination Stress Rupture per ASTM E292-09:

ID	Temp(°F)	Stress(ksi)	El(%in4d)	Rupture Life (hrs)**	Rupture Location
UI	1200	70	18.6	70.9	Smooth

\*\*Upload after 48 hrs./ 5 KSI/ every 8-10 hrs./ final stress 85 KSI

This test was performed at Westmoreland Mechanical Testing & Research, Inc.,  
Report No. 1-70189.

Country of origin (Manufacturing & Melting): USA

During the manufacturing process, this material has not come in direct contact with Mercury or any of its compounds or any Mercury or Cobalt 60 or other radioactive sources containing device employing a single boundary of containment. Material is also weld and radioactive contamination free.

A73231  
RCCLIFF WIRE, INC.  
CS31A

Testing methods for chemical analysis tested at Latrobe Specialty Steel are as follows: C, S, N, O & H - Combustion  
SI, Mn, W, Cr, V, Ni, Mo, Cu, Al >1%, Ti >1%, Co, Ta, Fe & Sn - X-Ray. Balance of elements analyzed on OEL.  
Other testing methods not listed above have been conducted per certified material specification(s).

Latrobe Specialty Steel Company is registered to Quality Management System Standards: ISO 9001 and AS9100.

Need certs? Our air melt certs are available online at <http://www.latrobesteel.com>

We certify this material to have been manufactured, inspected, and tested, and found the results to conform to all drawing and/or specification requirements and order requirements as applicable. The recording of false, fictitious or fraudulent statements or entries on the documents may be punishable as a felony under Federal Statute. This certificate or report shall not be reproduced except in full, without the written approval of Latrobe Specialty Steel Company.

Page 2 of 2

*Paula M. Platt*

Inspection Department Date 08/29/11  
Paula M. Platt - Sr. Metallurgical Certification Coordinator



7.15.13

REC'D APR 11 2013



9/23/15  
JH



**PEERLESS AEROSPACE FASTENER CORP.**  
141 Executive Blvd, PO Box 710, Farmingdale, NY 11735-0710  
Expediting/Quality (631) 962-2214 Fax (631) 420-9617  
Accounting (631) 962-2211 Sales (631) 420-8200

\*\*\*\*\*  
\* P A C K I N G \*  
\*\*\*\*\*  
Cust ID.....E232  
Invoice No...INY2QGNN  
Invoice Date.09/02/15

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EAST COAST AVIATION SUPPLIES  
399 EAST DRIVE  
MELBOURNE, FL 32904

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EAST COAST AVIATION SUPPLIES  
399 EAST DRIVE  
MELBOURNE, FL 32904

CUST.P.O.#: FL75162  
OUR SALE#: SNYCKVZK  
TERMS: NET 30  
WEIGHT 900.00

SHIP MODE: FED EX FREIGHT  
WAYBILL NO.: 3139755511  
F.O.B.: FARMINGDALE  
NO. OF CARTONS: 24

ITEM NO.	QUANTITY ORDERED	U/M	QUANTITY SHIPPED	BALANCE DUE	CUSTOMER PART NO./PEERLESS PART NO.	UNIT PRICE	TOTAL
1	10000	EA	10000	0	CR3212-4-5 <b>ACCEPTED</b>		
			10000	LOT: 87856828 MFG: CHERRY DESC: A/C FASTENERS: 8803.30.0010			
2	10000	EA	10000	0	CR3212-5-2 <b>ACCEPTED</b>		
			10000	LOT: 88048656 MFG: CHERRY DESC: A/C FASTENERS: 8803.30.0010			
4	2500	EA	2500	0	CR3213-4-8 <b>ACCEPTED</b>		
			2500	LOT: 87740959 MFG: CHERRY DESC: A/C FASTENERS: 8803.30.0010			
5	25000	EA	25000	0	CR3213-5-2 <b>ACCEPTED</b>		
			25000	LOT: 88075362 MFG: CHERRY DESC: A/C FASTENERS: 8803.30.0010			
6	25000	EA	25000	0	CR3213-5-4 <b>ACCEPTED</b>		
			4200	LOT: 88040871 MFG: CHERRY			
			20800	LOT: 88070323 MFG: CHERRY DESC: A/C FASTENERS: 8803.30.0010			
7	10000	EA	10000	0	CR3213-5-5 <b>ACCEPTED</b>		
			10000	LOT: 87987356 MFG: CHERRY			

CONTINUED ON NEXT PAGE

LISA FOGARTY

Additional Release  
Statements on Reverse

The quality system of this facility has been registered to the  
ISO 9001: 2008, AS9100-C and AS9120-A, Rev. Standards.

sealed and shipped by



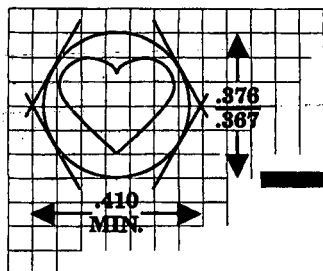
Additional Release Statements on Reverse  
Peerless BAE#. BAE/AG/20403/MMA  
Peerless AirbusUK#. 91011  
PAYABLE IN U.S. DOLLARS / COUNTRY OF ORIGIN U.S.A.

The customer's use of a part number/description or our recital of a customer's designated part number/description does not of itself commit Peerless to supply parts of a specific manufacturer. If a manufacturer named is not satisfactory, please contact Peerless' Customer Service Department within 10 days after receipt to obtain authorization to return.

CERTIFICATE OF CONFORMANCE

It is hereby certified that all articles in the above shipment and in the quantities as called for in the above contractor's purchase order are in conformance with the requirements, specifications and drawings applicable to that order.

By: *Ralph Fies*  
Title: QUALITY ASSURANCE MANAGER



# HEARTLAND

## PRECISION FASTENERS INC

301 Prairie Village Dr.  
New Century, Kansas 66031

Toll Free (877) 4HP-BOLT  
(447-2658)

Tele (913) 829-4447  
Fax (913) 829-7282

EAR: ECCN 9A991d SCHEDULE B: 7318.15.2000

ECAS INC.  
399 EAST DRIVE  
MELBOURNE, FL 32904

QTY: 80

PO#: 62944 #2

CAGE CODE: 0ZC92

CERTIFICATE OF CONFORMANCE

HEARTLAND PRECISION FASTENERS, INC CERTIFIES THAT THE FASTENERS IN THIS SHIPMENT HAVE BEEN MANUFACTURED IN ACCORDANCE WITH HPFI'S QUALITY SYSTEM MANUAL, HPQM-001, REVISION H, APPLICABLE DRAWINGS, SPECIFICATIONS AND CONTRACT REQUIREMENTS. DIMENSIONAL, MECHANICAL, METALLURGICAL AND FINISH TESTS WERE PERFORMED AND CONFORM TO SAID SPECIFICATIONS. TRACEABILITY INFORMATION IS MAINTAINED AND ON FILE BY LOT NUMBER PER HPQP-018. WE CERTIFY THAT THIS LOT WAS MANUFACTURED FREE FROM MERCURY, RADIUM, ALPHA SOURCE CONTAMINATION AND OZONE DEPLETING SUBSTANCES.

PAGE 1 OF 1

PART: MS20004-24	REVISION: 3	LOT NO: 30237	CERT DATE: JUL 17 2012
DESCRIPTION: BOLT, INTERNAL WRENCHING		MFG. DATE: 12/13/06	
PROCUREMENT SPEC: NASM7838	REVISION: 2	IN-PROCESS INIT. DATE: 7/31/06	
MATERIAL SPEC: AMS 6322	REVISION: L	HEADMARK: MS20004	QUANTITY MANUFACTURED
RAW MAT.CERT: SEE ATTACHED	HEAT: CW275	SUPPLIER: UGINE	1,088

### MECHANICAL TESTING

ULTIMATE TENSILE STRENGTH				DOUBLE SHEAR STRENGTH		HARDNESS	
POUNDS	FRACTURE	POUNDS	FRACTURE	POUNDS		ROCKWELL C SCALE	
7,353	THREAD	7,411	THREAD	10,067	10,103	38	
7,289	THREAD	7,276	THREAD	10,133	10,131	37	
7,343	THREAD	7,280	THREAD	10,124	10,111	38	
7,374	THREAD	7,388	THREAD	10,143	10,074	36	
						37	
MIN:	6,190			MIN:	9,300	REQ'D:	34-40

FATIGUE: (SEE ATTACHED)

STRESS DURABILITY: (SAMPLE PCS: 8; LOAD APPLIED: 4,460 LBS; DISCONTINUED AFTER: 24 HOURS) PASS

### METALLURGICAL TESTING

MAG=100x	SAMPLE SIZE	DISCONTINUITIES	SURFACE CONTAMINATION:	GRAIN FLOW:	MICROSTRUCTURE:
NITAL	8	ACCEPTABLE	NONE	ACCEPTABLE	SATISFACTORY

### SPECIAL PROCESSES:

HEAT TREATMENT PER AMS 2759/1 REV. C (SEE ATTACHED)

FINISH CADMIUM PLATE PER AMS-QQ-P-416(B) TYPE II, CLASS 2 (SEE ATTACHED)

THREADS 1/4-28 UNJF-3A STANDARD PER AS8879(D)

NDT	MAGNETIC PARTICLE INSPECT PER ASTM E 1444-05	ACCEPT:	REJECT:
		100%	0

STAMP: AUTHORIZED QUALITY REPRESENTATIVE  
VERN MCHENRY

HPF 1801 REV. B DATED 4/21/10

THE ORIGINAL OF THIS CERTIFICATE HAS A RAISED SEAL & SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF HPFI LABORATORY.

ISO 9001: 2000 AND AS9100 REVISION B  
MADE IN THE UNITED STATES OF AMERICA



UGINE STAINLESS & ALLOYS Inc.  
Arceior Group

## CERTIFICATE OF ANALYSIS

OUR ORDER NO.: 09-14218

DATE: 03/30/04

FOR: Heartland Precision



VENDOR TAG NO.: D1351

PART NO.: \_\_\_\_\_

OUR INVOICE NO.: \_\_\_\_\_

GRADE: 8740

DESCRIPTION: CHQ WIRE

SIZE: .253"

HEAT NO.: CW275

### CHEMICAL ANALYSIS

<u>C</u>	<u>Si</u>	<u>Mn</u>	<u>P</u>	<u>S</u>	<u>Cu</u>	<u>Ni</u>	<u>Cr</u>	<u>Mo</u>
.40	.25	.85	.013	.006	.01	.53	.50	.25

OTHERS:

### PHYSICAL PROPERTIES

TENSILE STRENGTH: 83.6

HARDNESS: 12.0

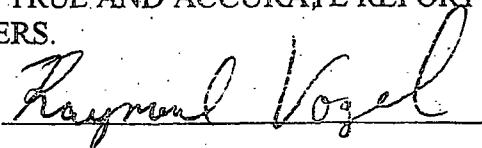
YIELD STRENGTH: 69.7

% RED. OF AREA: 77.1

ELONGATION % IN 2": 20.0

SPECIFICATIONS: AISI 8740H PASAIP, AMS 6322L, AMS 2301G  
MIL-STD 6049A, ASTM A 574 00; ASTM E 381-01

SUBSCRIBED AND SWORN TO BEFORE ME THIS 14th DAY OF NOVEMBER  
2003. WE CERTIFY THE FOREGOING A TRUE AND ACCURATE REPORT AS  
REPRESENTED TO US BY OUR SUPPLIERS.



General Manager

Posco-Korea

## INSPECTION CERTIFICATE



DONGBU STEEL CO., LTD.

Certificate No. 80004855

Date of Issue : JAN 20, 2004

P/O No 09-14218

Customer UGINE STAINLESS &amp; ALLOYS INC

Packing P.P CLOTH + BUNDLE

\*Head Office : Dongbu BLDG, 891-10, Daechi-Dong

Kangnam-Gu, SEOUL, KOREA

Phone 82-2-3450-8455-8

FAX : 82-2-3450-8522

\*Pohang Works : 792-1, Gori-Dong, Nam-Gu, Pohang-City

Kyoungsangbuk-Do, KOREA

Phone : 82-54-289-2141-5

FAX 82-54-289-2146

## 1. COMMODITY &amp; QUANTITY

## HARDENABILITY RESULT

File no.	Commodity	Dimension	Coil no.	Cods	Weight	Heat No.	Core	Surface
11C13A	AISI8740H PSASAIP AMS 6322L, AMS 2301G MIL-STD-6049A ASTM A 571-00 ASTM E 381-01 === TOTAL ===	0.253 INCH	1 9	9	12.746 LBS	CW275	53.6	51.0
					12.746 LBS			

## 2. CHEMICAL COMPOSITION(%)

## NON-METALLIC INCLUSIONS

2. CHEMICAL COMPOSITION																									CLEANLINESS		
C	Si	Mn	P	S	Cu	Ni	Cr	Mo	S-Al	Ti	Pb	Bi	Sn	V	B	O	THIN				HEAVY				Clean- liness	PClean- liness	Sclean- liness
×100			×1000		×100				×1000		×100			×10000			A	B	C	D	A	B	C	D			
40	25	85	13	6	1	53	50	25																0.08	0.05		

## 3. PHYSICAL PROPERTY

TENSILE PROPERTY																									
Tensile Strength			Yield Strength			Elongation		Reduction Of Area		Hardness		SA Ratio		DM-F		DM-T		Seam Depth		Grain Size	Coating Weight		Macro Struc- ture	Upset Ratio %	Remarks
N/㎟ K kg/㎟			N/㎟ K kg/㎟			%		%		A:HV B:HRB C:HRC		%		A:mm B:inch		A:mm B:inch		A:mm B:inch			g/㎡				
Q	75.0	90.0									23.0	90									10	14		80	Requirement
Q	79.9	83.6	Q	65.1	69.7	18.0	20.0	75.6	77.1	C	11.0	12.0	90							8.0	10	11		80	Result
																				S2-R1-C2 OR BETTER					

This is to certify that the commodity mentioned hereunder has been duly  
inspected by our inspection department and up to the purchasers requirements.

Manager of Quality  
Assurance Team

YeonHo Lee

PQ - QA - 022(312 x 203mm)

1994. 5. 1 Approval.

DONGBU STEEL CO., LTD.



PAULO  
PRODUCTS  
COMPANY

HEAT TREATERS  
AND FINISHERS  
OF METAL

4827 CHELSEA AVE.  
KANSAS CITY, MO 64130  
TEL: (816)861-7500  
FAX: (816)924-7300

CERTIFIED INSPECTION  
REPORT

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HEARTLAND PRECISION FASTENERS  
301 PRAIRIE VILLAGE DR  
NEW CENTURY, KS 66031

PAULO #: 725744-08

DATE: 01/15/2007

DATE REC'D: 01/09/2007

SHIP TO CODE:

PART DESC: CROSS SECTION .256  
PART NAME: BOLT, INTERNAL WRENCHING  
PART #: MS20004-24  
QUANTITY: 1218 PCS  
MATERIAL: 8740

CUSTOMER PO:  
CUSTOMER DRAY:  
CUSTOMER JOB: 30237  
LOT #:  
OTHER #:

Requirements:

Process in accordance with AMS 2759/1C, as  
referenced in AMS-H-6875A.

Final mid-radius hardness 36-40 HRC

QUANTITY INSPECTED: 5  
INSPECTION RESULTS: 36.8-38.1 HRC



Certified Furnace # 902 Cycle/Load # 61  
High heat temp/time: 1550  $\pm$  25° F/ 85 min Quench: Oil  
Temper furnace: 931 Temper temp/time: 880  $\pm$  15° F/ 2 hr 10 min

\*Paulo is responsible for hardness testing only, customer responsible for all other testing. Paulo is not responsible for tensile testing\*

I CERTIFY THAT APPLICABLE MATERIAL PROCESSES HAVE BEEN PERFORMED IN ACCORDANCE WITH THE SPECIFICATION SHOWN ABOVE.  
I HAVE INSPECTED THE WORK AND THE SAMPLING AND RESULTS ARE AS INDICATED.

Approved By

Inspector Signature

# **Aerospace Plating Company**

*A division of Heartland Precision Fasteners, Inc.*

**301 Prairie Village Drive**

**New Century, Ks. 66031**

**Ph: (913)829-4447**

**Fax: (913)829-7282**

## **\*\*Certification\*\***

**Date: 3/12/07**



### **Customer:**

**Heartland Precision Fasteners, Inc.**

**301 Prairie Village Drive**

**New Century, KS 66031**

**Process: AMS-QQ-P-416, Revision B, Type II, Class 2.**

**Lot Number: 30237**

**Part Number: MS20004-24**

**Weight:= 51 #**

**Aerospace Plating Company certifies that the above parts have been cleaned and then stress relieved for a minimum of 4 hours at 375 degrees, +/- 25 degrees, prior to cadmium plating per specification:**

**AMS-QQ-P-416, Rev. B, Type II, Class 2**

**And have undergone embrittlement relief within 4 hours of plating via baking at 375 degrees, +/- 25 degrees, for a minimum of 23 hours.**

**Authorized Signature:**

A handwritten signature in black ink, appearing to read 'Martin Vail', written over a horizontal line.

**Martin Vail**

**TEST REPORT**

"Sample(s): Customer Supplied"

**ATLAS****TESTING LABORATORIES, INC.**

ATLASLABS@WORLDNET.ATT.NET

6929 EAST SLAUSON AVENUE • LOS ANGELES, CA 90040 • 323-722-8810 FAX 323-888-1493

JKD

HEARTLAND PRECISION FASTENERS INC.

ATTN: NATASHA M C CLARK

301 PRAIRIE VILLAGE DRIVE

NEW CENTURY, KS. 66031

PAGE 1 OF 1

DATE: 04/03/07

ATL# 737665

PO# 30237

MAT'L.: 8740

SPEC.: NASM 7838 REV. 2,  
CUST./REQ.

PART# MS20004-24 REV. 2

COST CENTER LOT# 30237

QTY: 8 COUPONS

**TENSION FATIGUE OF FASTENER TEST REPORT:** (AT ROOM TEMPERATURE)

S/N	SIZE (IN)	HIGH LOAD (LBS)	LOW LOAD (LBS)	CYCLES TO FAILURE OR STOP	LOCATION OF FRACTURE
1	1/4-28	2,710	271	130,000	NO FRACTURE
2	1/4-28	2,710	271	130,000	NO FRACTURE
3	1/4-28	2,710	271	130,000	NO FRACTURE
4	1/4-28	2,710	271	130,000	NO FRACTURE
5	1/4-28	2,710	271	130,000	NO FRACTURE
6	1/4-28	2,710	271	130,000	NO FRACTURE
7	1/4-28	2,710	271	130,000	NO FRACTURE
8	1/4-28	2,710	271	130,000	NO FRACTURE

AVERAGE CYCLES TO FAILURE OR STOP:

130,000

MINIMUM ACCEPTABLE REQUIREMENTS:

100,000

MINIMUM REQUIREMENTS FOR SAMPLING:

45,000

AVERAGE REQUIREMENTS FOR RESAMPLING:

65,000

STOP REQUIREMENTS:

130,000

TEST MACHINE USED: MTS812 ATE# 303

SPEED OF TESTING: 16 Hz

(CALIBRATION DATE 10/23/06 TO 04/23/07)

NUT USED: NASM-1312 TYPE A

NUT SUPPLIED BY: ATLAS

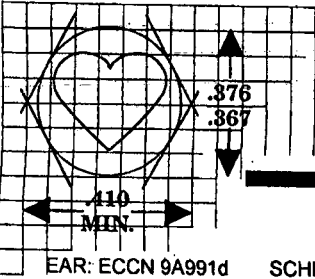
TEST METHOD: NASM-1312-11/97

TESTING TEMPERATURE: 70-71°F

REMARKS: Conforms to requirements.

Respectfully submitted,

  
Ryan Rouda  
Quality Control



# HEARTLAND

## PRECISION FASTENERS INC

301 Prairie Village Dr.  
New Century, Kansas 66031

Toll Free (877) 4HP-BOLT  
(447-2658)

Tele (913) 829-4447  
Fax (913) 829-7282

CAGE CODE: 0ZC92

CERTIFICATE OF CONFORMANCE

HEARTLAND PRECISION FASTENERS, INC CERTIFIES THAT THE FASTENERS IN THIS SHIPMENT HAVE BEEN MANUFACTURED IN ACCORDANCE WITH HPFI'S QUALITY SYSTEM MANUAL, HPQM-001, REVISION H, APPLICABLE DRAWINGS, SPECIFICATIONS AND CONTRACT REQUIREMENTS. DIMENSIONAL, MECHANICAL, METALLURGICAL AND FINISH TESTS WERE PERFORMED AND CONFORM TO SAID SPECIFICATIONS. TRACEABILITY INFORMATION IS MAINTAINED AND ON FILE BY LOT NUMBER PER HPQP-018. WE CERTIFY THAT THIS LOT WAS MANUFACTURED FREE FROM MERCURY, RADIUM, ALPHA SOURCE CONTAMINATION AND OZONE DEPLETING SUBSTANCES.

PAGE 1 OF 1

ECAS INC.  
399 EAST DRIVE  
MELBOURNE, FL 32904

QTY: 1,500

PO#: 65208 #2

PART: MS20004-24	REVISION: 3	LOT NO: 43036	CERT DATE: JUN 29 2018
DESCRIPTION: BOLT, INTERNAL WRENCHING	MFG. DATE: 4/2/13		
DFARS 252.225-7014 ALT I COMPLIANT	IN-PROCESS INIT. DATE: 12/20/12		
PROCUREMENT SPEC: NASM7838	REVISION: 3	HEADMARK: MS20004	✓
MATERIAL SPEC: AMS 6322	REVISION: N	GRADE: 8740	QUANTITY MANUFACTURED
RAW MAT. CERT: SEE ATTACHED	HEAT: 10177570	SUPPLIER: WIRETECH	6,130

### MECHANICAL TESTING

ULTIMATE TENSILE STRENGTH				DOUBLE SHEAR STRENGTH		HARDNESS	
POUNDS	FRACTURE	POUNDS	FRACTURE	POUNDS		ROCKWELL C SCALE	
7,353	THREAD	7,427	THREAD	9,965	10,029	39	
7,487	THREAD	7,343	THREAD	10,036	10,112	37	
7,495	THREAD	7,400	THREAD	9,959	10,073	36	
7,435	THREAD	7,386	THREAD	10,006	9,950	36	
						36	
MIN:	6,190			MIN:	9,300	REQ'D:	36-40

FATIGUE: (SEE ATTACHED)

STRESS DURABILITY: (SAMPLE PCS: 8; LOAD APPLIED: 4,460 LBS; DISCONTINUED AFTER: 24 HOURS) PASS

### METALLURGICAL TESTING

MAG=100x	SAMPLE SIZE	DISCONTINUITIES	SURFACE CONTAMINATION:	GRAIN FLOW:	MICROSTRUCTURE:
NITAL	8	ACCEPTABLE	NONE	ACCEPTABLE	SATISFACTORY

### SPECIAL PROCESSES:

HEAT TREATMENT PER AMS 2759/1 REV. E (SEE ATTACHED)

FINISH CADMIUM PLATE PER AMS-QQ-P-416(C) TYPE II, CLASS 2

THREADS 1/4-28 UNJF-3A STANDARD PER AS8879(D)

NDT MAGNETIC PARTICLE INSPECT PER ASTM E 1444-11

ACCEPT:	REJECT:
100%	0

STAMP:



AUTHORIZED QUALITY REPRESENTATIVE  
VERN MCHENRY

HPF 1801 REV. B DATED 4/21/10

THE ORIGINAL OF THIS CERTIFICATE HAS A RAISED SEAL & SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF HPFI LABORATORY.



**WireTech, Inc.**

6440 E. Canning Street  
Los Angeles, CA 90040  
Phone (323) 722-4933  
Fax (323) 721-2738

SOLD TO

Heartland Precision Fastener  
301 Prairie Village Drive  
New Century, KS 66031  
USA

WORK ORDER  
095991

CERTIFICATION

HEAT NO.  
10177570  
SALES ORDER / RLS  
847562 / 3  
ISO 9001-2000 REGISTERED



MECHANICAL TESTING  
CERT # 911.01

CERT# 911.01

CUSTOMER P.O. 27620	CUSTOMER PART	QUANTITY 3,319 Lbs	CARRIERS 3	LADING NO 00102025	SHIPMENT DATE 02/08/2013			
<b>SPECIFICATION H078740-1024725A</b> <b>A-8740, AQ, SKFG, CHQ WIRE, SEAM &amp; DECARB FREE, SAIP Zinc Phosphate, Lime &amp; Stearate Coating,</b> <b>Size:0.247/0.2475 Specifications: AMS 2301K, AMS 6322N, MIL-S-6049A AMEND 1, AMS-S-6049A</b>								
CERTIFICATION REQUIREMENTS								
Chemical Properties								
C	Si	Mn	P	S	Cu	Ni	Cr	Mo
.41	.23	.85	.01	.004	.09	.43	.53	.21
Physical Properties								
Grain Size Jominy 1		Jominy 2	Jominy 3	Inclusions Macro	Cleanliness	Mill Source		
6 J5=54		J8=47	J10=44	S2-R1-C2	GOOD	F&S=0	Charter	
Country of Origin								
USA - DFAR Compliant								
Mechanical Properties								
TEST	UNITS					Results		
Tensile Strength	KSI					85.4		
Yield Strength	KSI					72.6		
% Elongation	%					26		
% Reduction of Area	%					73.2		
Rockwell Hardness B Scale	HRB (s)					88		
Decarb (Total)	In					0.00		

Merchandise covered by this invoice is warranted to be free from defects in workmanship or material but not for any specific length of time, type or measure of service. No claim for allowance will be recognized unless presented in writing within 10 days time after receipt of material. Our maximum liability for any claim predicated upon defective merchandise is limited to replacement of it, or to repayment of it, or to repayment of the purchase price thereof, as we elect. Material cut to specific length or size cannot be returned for credit and request for cancellation of such orders will not be considered if manufacture has been commenced. Buyer, by acceptance of the merchandise covered by this invoice, agrees to the foregoing terms and conditions and those set forth on the reverse hereof. The recording of false, fictitious or fraudulent statements or entries on this document may be punished as a felony under Federal statutes including Federal law, Title 18, Chapter 47.

REPRODUCTION OF THIS CERTIFICATION IS NOT ALLOWED UNLESS IN FULL.

Wire Tech, Inc. metallurgical laboratory is accredited in the following test: chemical analysis per ASTM E 415, mechanical testing per ASTM A 370, Rockwell hardness per ASTM E 18, metallographic mount preparation per ASTM E 3, decarburization depth per ASTM E 1077, IFI 140, inclusion rating per ASTM E 45, decarburization performed as per IFI 140. The reported Chemical and Physical Properties are Mill Source results. Transcribed from mill certificates. HRB(W) are hardness results performed with a 1/16" carbide ball. Unless otherwise specified, HRB and HRC results are conversions from ASTM A370 tables 1 and 2. \*Test result not covered by our current A2LA accreditation. Tests which have been undertaken by a subcontractor laboratory that is not accredited are not endorsed by A2LA or covered by Wire Tech, Inc. A2LA accreditation.

TEST RESULTS RELATE ONLY TO THE ITEMS TESTED. DFAR Material per Clauses 252.225-7014 ALT. 1, 252.225-7009, & 225.003(9)

"LATEST REVISIONS OF ASTM"

Material is free of mercury, radium, or alpha contamination.



# CHARTER STEEL

A Division of  
Charter Manufacturing Company, Inc.

EMAIL

1658 Cold Springs Road  
Saukville, Wisconsin 53080  
(262) 268-2400  
1-800-437-8789  
FAX (262) 268-2570

## CHARTER STEEL TEST REPORT Reverse Has Text And Codes

Wiretech Incorporated  
6440 East Canning Street  
Attn: Andre Stephan  
Los Angeles, CA-90040

Cust P.O.	6798-4
Customer Part #	8740C1A090-C-R
Charter Sales Order	70029478
Heat #	10177570
Ship Lot #	4125321
Grade	8740 R SK FG AQ 23/64
Process	HRSA
Finish Size	23/64

I hereby certify that the material described herein has been manufactured in accordance with the specifications and standards listed below and on the reverse side, and that it satisfies these requirements.

### Test Results of Heat Lot# 10177570

Lab Code: 7388

CHEM	C	MN	P	S	SI	NI	CR	MO	CU	SN	V
%WT	.41	.85	.010	.004	.23	.43	.53	.21	.09	.008	.001
	AL	N	B	TI	NB						
	.028	.0050	.0001	.001	.002						

JOMINY(HRC)	JOM01	JOM02	JOM03	JOM04	JOM05	JOM06	JOM07	JOM08	JOM09	JOM10	JOM12
	57	57	57	58	54	51	49	47	46	44	41
	JOM14	JOM16	JOM18	JOM20	JOM24	JOM28	JOM32				
	39	37	36	34	32	31	29				

JOMINY SAMPLE TYPE ENGLISH = C  
E45 INCLUSION LAB = 0358-02

Cleanliness

ASTM-E45 Method A

	A	B	C	D
Thin	1.1	1.5	.0	.5
Heavy	.0	.0	.0	.5

LOC1 = 1-3	AT = 1.0	AH = .0	BT = .5	BH = .0	CT = .0	CH = .0	DT = .5	DH = .5
LOC2 = 1-11	AT = 1.0	AH = .0	BT = 2.5	BH = .0	CT = .0	CH = .0	DT = .5	DH = .5
LOC3 = 2-3	AT = 1.0	AH = .0	BT = 1.5	BH = .0	CT = .0	CH = .0	DT = .5	DH = .5
LOC4 = 2-6	AT = 1.0	AH = .0	BT = 1.5	BH = .0	CT = .0	CH = .0	DT = .5	DH = .5
LOC5 = 3-3	AT = 1.0	AH = .0	BT = 2.0	BH = .0	CT = .0	CH = .0	DT = .5	DH = .5
LOC6 = 4-3	AT = 1.5	AH = .0	BT = 1.0	BH = .0	CT = .0	CH = .0	DT = .5	DH = .5

MACRO ETCH SURFACE = 1 MACRO ETCH RANDOM = 1 MACRO ETCH CENTER = 1  
AMS 2301 FREQUENCY AVERAGE = .00 AMS 2301 FREQUENCY INDIVIDUAL = .00  
AMS 2301 SEVERITY AVERAGE = .00 AMS 2301 SEVERITY INDIVIDUAL = .00  
CHEM. DEVIATION EXT.-GREEN =

### Test Results of Rolling Lot# 1061032

REDUCTION RATIO = 299:1

### Test Results of Processing Lot# 4125308,4125321

	# of Tests	Min Value	Max Value	Mean Value	
TENSILE	2.0	83.7	83.9	83.8	TENSILE LAB = 0358-02
REDUCTION OF AREA	2	66	68	67	RA LAB = 0358-02
ROCKWELL B	2	83	84	84	RB LAB = 0358-02

NUM DECARB = 3 FREE FERRITE DECARB = .000 FREE FERR & PARTIAL DECARB = .003  
CP SPHERO % LAB = 0358-02 NUM SPHERO = 3 SPHERODIZATION = 81.7

Specifications: Manufactured per Charter Steel Quality Manual Rev 9,08-01-09

Charter Steel  
Saukville, WI, USA



Rem: Load1,Fax0,Mail0

Page 1 of 2

This MTR supersedes all previously  
dated MTRs for this order.

*Janice Barnard*  
Janice Barnard  
Manager of Quality Assurance  
02/28/2012



**CHARTER  
STEEL**

EMAIL

1658 Cold Springs Road  
Saukville, Wisconsin 53080

(262) 268-2400

1-800-437-8789

FAX (262) 268-2570

A Division of  
Charter Manufacturing Company, Inc.

**CHARTER STEEL TEST REPORT**  
**Reverse Has Text And Codes**

Wiretech Incorporated  
6440 East Canning Street  
Attn: Andre Stephan  
Los Angeles, CA-90040

Cust P.O.	6798-4
Customer Part #	8740C1A090-C-R
Charter Sales Order	70029478
Heat #	10177570
Ship Lot #	4125321
Grade	8740 R SK FG AQ 23/64
Process	HRSA
Finish Size	23/64

I hereby certify that the material described herein has been manufactured in accordance with the specifications and standards listed below and on the reverse side, and that it satisfies these requirements.

Meets customer specifications with any applicable Charter Steel exceptions for the following customer documents:  
Customer Document = AMS6322N/AMS2301K/COP3010M/BS2S147:1976 CHEM ONLY Revision = Dated =

Additional Comments:

Charter Steel  
Saukville, WI, USA

Rem: Load1,Fax0,Mail0



Page 2 of 2

This MTR supersedes all previously  
dated MTRs for this order

*Janice Barnard*  
Janice Barnard  
Manager of Quality Assurance  
02/28/2012

The following statements are applicable to the material described on the front of this Test Report:

1. Except as noted, the steel supplied for this order was melted, rolled, and processed in the United States meeting DFAR's compliance.
2. Mercury was not used during the manufacture of this product, nor was the steel contaminated with mercury during processing.
3. Unless directed by the customer, there are no welds in any of the coils produced for this order.
4. The laboratory that generated the analytical or test results can be identified by the following key:

Certificate Number	Lab Code	Laboratory		Address
0358-01	7388	CSSM	Charter Steel Melting Division	1653 Cold Springs Road, Saukville, WI 53080
0358-02	8171	CSSR/CSSP	Charter Steel Rolling/Processing Division	1658 Cold Springs Road, Saukville, WI 53080
0358-03	123633	CSFP	Charter Steel Ohio Processing Division	6255 US Highway 23, Risingsun, OH 43457
0358-04	125544	CSCM/CSCR	Charter Steel Cleveland	4300 E. 49th St., Cuyahoga Heights, OH 44125-1004
.	.	--	Subcontracted test performed by laboratory not in Charter Steel system	

5. When run by a Charter Steel laboratory, the following tests were performed according to the latest revisions of the specifications listed below, as noted in the Charter Steel Laboratory Quality Manual:

Test	Specification	CSSM	CSSR/CSSP	CSFP	CSCM/CSCR
Chemistry Analysis	ASTM E415; ASTM E1019	X			X
Macroetch	ASTM E381	X			X
Hardenability (Jominy)	ASTM A255; SAE J406; JIS G0561	X			X
Grain Size	ASTM E112	X	X	X	X
Tensile Test	ASTM E8; ASTM A370		X	X	X
Rockwell Hardness	ASTM E18; ASTM A370	X	X	X	X
Microstructure (spheroidization)	ASTM A892		X	X	
Inclusion Content (Methods A, E)	ASTM E45		X		X
Decarburization	ASTM E1077		X	X	X

Charter Steel has been accredited to perform all of the above tests by the American Association for Laboratory Accreditation (A2LA). These accreditations expire 01/31/13.

All other test results associated with a Charter Steel laboratory that appear on the front of this report, if any, were performed according to documented procedures developed by Charter Steel and are not accredited by A2LA.

6. The test results on the front of this report are the true values measured on the samples taken from the production lot. They do not apply to any other sample.
7. This test report cannot be reproduced or distributed except in full without the written permission of Charter Steel. The primary customer whose name and address appear on the front of this form may reproduce this test report subject to the following restrictions:
  - It may be distributed only to their customers
  - Both sides of all pages must be reproduced in full
8. This certification is given subject to the terms and conditions of sale provided in Charter Steel's acknowledgement (designated by our Sales Order number) to the customer's purchase order. Both order numbers appear on the front page of this Report.
9. Where the customer has provided a specification, the results on the front of this test report conform to that specification unless otherwise noted on this test report.





PAULO HEAT TREATERS  
PRODUCTS AND FINISHERS  
COMPANY OF METAL

4827 CHELSEA AVENUE  
KANSAS CITY, MO 64130  
TEL: (816)861-7500  
FAX: (816)924-7300

# CERTIFIED INSPECTION REPORT

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HEARTLAND PRECISION FASTENERS  
301 PRAIRIE VILLAGE DR  
NEW CENTURY, KS 66031

PAULO #: 1182091-04  
DATE: 06/07/2013  
DATE REC'D: 06/04/2013  
SHIP TO CODE:

PART DESC: CROSS SECTION .256 X 2L  
PART NAME: BOLT, INTERNAL WRENCHING  
PART #: MS20004-24  
QUANTITY: 6870 PCS  
MATERIAL: 8740

CUSTOMER PO:  
CUSTOMER DRAY:  
CUSTOMER JOB: 43036  
LOT #:  
OTHER #:

Requirements:  
Process per HEARTLAND PRECISION FASTENERS spec  
HPQP-057, HO0078 rev NEW.  
and per SAE spec AMS 2759/1 rev E,  
and per SAE spec AMS-H-6875 rev B.  
Final mid-radius hardness 37-40 HRC

## INSPECTION RESULTS:

MID-RADIUS HARDNESS  
Count: 5  
Range: 37 -38 HRC

Certified Furnace # 501 Cycle/Load # 14  
High heat temp: 1550±25° F Soak time: 80min  
Quench: Oil  
Temper furnace: 531 Temper temp/time: 900±15° F/ 2hrs

JUN 07 2013



\*Paulo is responsible for hardness testing only, customer responsible for all other testing. Paulo is not responsible for tensile testing\*

I CERTIFY THAT APPLICABLE MATERIAL PROCESSES HAVE BEEN PERFORMED IN ACCORDANCE WITH THE SPECIFICATION SHOWN ABOVE.  
I HAVE INSPECTED THE WORK AND THE SAMPLING AND RESULTS ARE AS INDICATED.

Approved By

Inspector Signature

JUN 28 2013

Element Materials Technology  
2 Pheasant Run  
Newtown, PA  
18940-1819 USA

Phone: 610-271-7591  
F: 215-579-7591  
T: 610-271-7591  
info.newtown@element.com  
element.com



Contact: Bryan Johnson  
Heartland Precision Fasteners  
301 Prairie Village Drive  
NEW CENTURY, KS 66031

**TEST CERTIFICATE — EAR-CONTROLLED DATA**

Date: 6/28/2013  
P.O. No.: 43036  
W/O No.: HFA016-06-26-11341-1

**PART NUMBER** MS20004-24 Rev. 3  
**LOT NUMBER** 43036  
**DESCRIPTION** .250"-28 x 2.00" Internal Wrenching Bolt  
**SPECIFICATION** NASM 7838 Rev. 2

**Tension Fatigue Test At Room Temperature**

Specification Requirements:  
65,000 Cycles min. (individual)  
Discontinue after 130,000 cycles  
Mating part - Fatigue Test Nut A  
Frequency: 60 Hz Grip Length: 1.500"

Sample	Maximum Load (lbs.)	Minimum Load (lbs.)	Cycles to Failure	Location of Failure	Pass/Fail
1	2,710	271	91,396	Threads	Pass
2,3,5,6,7	2,710	271	130,000	—	Pass
4	2,710	271	125,515	Threads	Pass
8	2,710	271	107,075	Threads	Pass

Machine Used: Instron 8500/55 KIP Load Cell  
Serial Number: C1926 / UK550  
Calibration Date: 02/15/10

All tests listed on this certification have been performed in accordance with NASM 7838 Rev. 2 and all tested samples do conform to the specification requirements.

This document contains technical data whose export and re-export/retransfer is subject to control by the U.S. Department of Commerce under the Export Administration Act and the Export Administration Regulations. The Department of Commerce's prior written approval may be required for the export or re-export/retransfer of such technical data to any foreign person, foreign entity or foreign organization whether in the United States or abroad.

Respectfully submitted

*Donna Jackins*

Donna Jackins  
Quality Administrator

Information and statements in this report are derived from material, information and/or specifications furnished by the client and exclude any expressed or implied warranties as to the fitness of the material tested or analyzed for any particular purpose or use. The testing reported on this certification has been performed in accordance with QAM 4th Edition Rev. 2 Dated 12/06/2011 and related procedures. All testing has been performed in accordance with the latest revision of the applicable published test method in effect at the time of testing, unless otherwise stated. This report shall not be reproduced except in full, without written approval of this laboratory. The recording of false, fictitious, or fraudulent statements or entries on this document may be punished as a felony under Federal Statutes including Federal Law Title 18, Chapter 47. Sample remnants are held for a minimum of 30 days following issuance of test results, at which point they will be discarded unless notified in writing by the client.

**ALL TESTING PERFORMED IN A MERCURY-FREE ENVIRONMENT**



**AIRFASCO**  
**INDUSTRIES**  
MANUFACTURER OF AEROSPACE PRODUCTS

2655 HARRISON AVE. SW  
CANTON, OH 44706  
PHONE: (330)430-6190  
FAX: (330)430-6199

**CERTIFICATE OF CONFORMANCE**

**EAST COAST AVIATION SUPPLIES**

I hereby certify that on 6/14/2010 AIRFASCO Industries provided the supplies called for by Contract/ PO Number **47635** in accordance with all applicable requirements for shipment. I further state that the process certifications are in conformance with the contract requirements, including specifications and/or drawings, physical item identification (part number) and the quantity shown on this or attached acceptance document. The part numbers certified below have been manufactured in the United States. DFAR 252.225-7014 ALT 1 compliant in fastener base raw material melt source only, with heat Number and country, does not include the post cadmium metal plating

  
WM. DENT

Quality Assurance Representative

PART NUMBER	LOT NUMBER	QUANTITY	PART NUMBER	LOT NUMBER	QUANTITY
MS21042L06 /	19141	49,000			



# AIRFASCO INDUSTRIES

MANUFACTURER OF AEROSPACE PRODUCTS

2655 HARRISON AVE. SW  
CANTON, OH 44706  
PHONE: (330)430-6190  
FAX: (330)430-6199

## PHYSICAL AND CHEMICAL CERTIFICATION

AFC LOT NO.: 19141 DATE MFG.: 6/10/2010 SAMPLE SIZE: 10 QTY MFG.: 49,900

PART NO.: AFC42-632L rev. 1 PROCUREMENT SPECIFICATION: NASM25027 SEP 1999

CONFORMS TO: MS21042L06 per NASM21042 OCT 1998, NAS1291-06 rev. 13

HEAT TREAT PROCUREMENT SPECIFICATION: MIL-H-6875 H, HRC 37.00 - 42.00  
VENDOR: Brite Metal CERT NO.: 79451-19123 HARDNESS: HRC 39.50 40.00

PLATING PROCUREMENT SPECIFICATION: Cadmium Plate per AMS-QQ-P-416C, type 2, class 2  
VENDOR: Lake City Plating CERT NO.: 79451-19141 PROCESS: bake 23 hrs 375 F within 1 hour

LUBE PROCUREMENT SPECIFICATION: SAE AS5272C type 1, bake 1 hour 375 F  
VENDOR: Everlube CERT NO.: 09-0136 RESULTS: .0003" 96 hr salt spray

NUT MATERIAL: UNS G87400, AISI 8740, AMS6322N, 5.5 mm drawn to .114" SAFS wire  
HEAT: CK177 MILL: Dungbu COUNTRY OF MELT: South Korea

ELEMENT-ID	-C-	-MN-	-P-	-S-	-SI-	-NI-	-CR-	-MO-	-CU-	-Al-	Other	Other
LADLE	0.410	0.900	0.015	0.005	0.260	0.560	0.490	0.240	0.040	0.000	-	-
CHECK	0.430	0.920	0.019	0.005	0.280	0.650	0.500	0.240	0.050	0.039	-	-

PHYSICAL PROPERTIES	AXIAL TENSILE	TORQUE IN MIN.	TORQUE OUT MAX.	TORQUE REMOVAL	WRENCH TORQUE	HARDNESS HRC 37-42
REQUIRED	1,670 lbs.	1.0 in-lbs.	10.0 in-lbs.	10.0 in-lbs.	20 in-lbs.	37.00-42.00
ACTUAL LOW	1,756 lbs.	2.6 in-lbs.	2.5 in-lbs.	2.3 in-lbs.	20 in-lbs.	39.50
ACTUAL AVG.	1,828 lbs.	3.6 in-lbs.	3.4 in-lbs.	3.2 in-lbs.	28 in-lbs.	39.75
ACTUAL HIGH	1,892 lbs.	5.2 in-lbs.	4.6 in-lbs.	4.2 in-lbs.	28 in-lbs.	40.00

23 hour stress embrittlement test 75-80% of tensile performed at 28 in-lbs., 1,336 lbs in accordance with MIL-STD-1312/14 NASM1312-8 formally MIL-STD-1312/8 max. load before deformation, strip or test bolt failure (lbs.)

Non-Destructive Magnetic Particle per ASTM-E-1444-05 sample lot size: 10

UNS G87400 is a specialty grade steel per DFAR 252.225-7014.

DFAR complaint 252.225-7014 Domestic Specialty Metals Alternate 1.

DFAR complaint by the more than 50% domestically melted rule as defined by 10 USC 2533b.

100% Inspected Lot, C=0, 0/PPM - INSPEC100

Metallurgical Examination satisfactory.

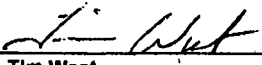
Product is Mercury (Hg) free.

Made in the USA.

# CONTROLLED

We hereby certify that the above data is correct and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries

Quality Assurance Representative: 

Tim West



**AIRFASCO**  
**INDUSTRIES**  
MANUFACTURER OF AEROSPACE PRODUCTS

2655 HARRISON AVE. SW  
CANTON, OH 44706  
PHONE: (330)430-6190  
FAX: (330)430-6199

**PHYSICAL TORQUE TEST CERTIFICATION**

AFC LOT NO.: 19141      DATE MFG.: 6/10/2010      SAMPLE SIZE: 10      QTY MFG.: 49,900

PART NO.: AFC42-632L rev. 1      PROCUREMENT SPECIFICATION: NASM25027 SEP 1999

CONFORMS TO: MS21042L08 per NASM21042 OCT 1998, NAS1291-06 rev. 13

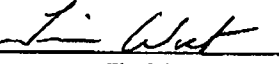
TORQUE TEST: Min. 1.0 in-lbs. max. 10.0 in-lbs. Installations are torque in values. Torques out values is the breakaway and removal unseated in the opposite assembly direction. First, seventh and fifteenth cycles with MS16997-20 test screws.

TORQUE SAMPLE	TORQUE 1st in	TORQUE 1st out	TORQUE 1st rem.	TORQUE 7th in	TORQUE 7th out	TORQUE 7th rem.	TORQUE 15th in	TORQUE 15th out	TORQUE 15th rem.	ACCEPT REJECT
1	3.9	3.7	3.4	3.6	3.2	3.1	3.0	2.9	2.8	ACC
2	4.0	4.0	3.8	3.6	3.4	3.3	3.4	3.1	3.0	ACC
3	5.2	4.6	4.2	4.6	4.2	3.9	4.0	3.7	3.2	ACC
4	4.0	3.9	3.8	3.7	3.4	3.4	3.2	3.0	3.0	ACC
5	4.2	4.4	3.5	3.8	3.4	3.2	3.1	2.8	2.6	ACC
6	3.5	3.5	3.3	3.2	3.3	3.0	2.9	2.6	2.5	ACC
7	3.9	3.6	3.2	3.3	3.0	2.7	2.6	2.5	2.3	ACC
8	3.6	3.7	3.3	3.5	3.4	3.0	3.1	2.9	2.7	ACC
9	4.1	3.7	3.5	3.6	3.4	3.1	3.0	2.9	2.6	ACC
10	4.4	4.1	4.0	3.7	3.5	3.2	3.2	3.0	2.9	ACC
low	3.5	3.5	3.2	3.2	3.0	2.7	2.6	2.5	2.3	ACC
avg.	4.1	3.9	3.6	3.7	3.4	3.2	3.2	2.9	2.8	ACC
high	5.2	4.6	4.2	4.6	4.2	3.9	4.0	3.7	3.2	ACC

**CONTROLLED**

We hereby certify that the above data is correct and conforms to the torque test requirements and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries

Quality Assurance Representative: 

Tim West



# AIRFASCO

## INDUSTRIES

MANUFACTURER OF AEROSPACE PRODUCTS

2655 HARRISON AVE. SW  
CANTON, OH 44706  
PHONE: (330)430-6190  
FAX: (330)430-6199

### PHYSICAL WRENCH TORQUE & EMBRITTLEMENT TEST CERTIFICATION

AFC LOT NO.: 19141

DATE MFG.: 6/10/2010

SAMPLE SIZE: 10

QTY MFG.: 49,900

PART NO.: AFC42-632L rev. 1

PROCUREMENT SPECIFICATION: NASM25027 SEP 1999

CONFORMS TO: MS21042L06 per NASM21042 OCT 1998, NAS1291-06 rev. 13

**WRENCH TORQUE TEST:** 20 in-lbs. min. proof load, 28 in-lbs. (HE) inspection for nut deformation. A wrenching torque test was performed in accordance with MIL-N-25027G with MS16997-20 test screws. After 23 hours minimum an examination under 10X magnification for deformation or cracks was performed and does meet specification requirements.

WRENCH SAMPLE	PROOF LOAD 60 in-lbs. min.	EMBRITTLEMENT 23 hours 84 in-lbs.	DATE and TIME TORQUED UP	DATE and TIME INSPECTED	EXAMINATION OF THE NUT	ACCEPT REJECT
1	20.0	28.0	3/17/10 5:45 AM	3/18/10 5:45 AM	no deformations	ACC
2	20.0	28.0	3/17/10 5:45 AM	3/18/10 5:45 AM	no deformations	ACC
3	20.0	28.0	3/17/10 5:45 AM	3/18/10 5:45 AM	no deformations	ACC
4	20.0	28.0	3/17/10 5:45 AM	3/18/10 5:45 AM	no deformations	ACC
5	20.0	28.0	3/17/10 5:45 AM	3/18/10 5:45 AM	no deformations	ACC
6	20.0	28.0	3/17/10 5:45 AM	3/18/10 5:45 AM	no deformations	ACC
7	20.0	28.0	3/17/10 5:45 AM	3/18/10 5:45 AM	no deformations	ACC
8	20.0	28.0	3/17/10 5:45 AM	3/18/10 5:45 AM	no deformations	ACC
9	20.0	28.0	3/17/10 5:45 AM	3/18/10 5:45 AM	no deformations	ACC
10	20.0	28.0	3/17/10 5:45 AM	3/18/10 5:45 AM	no deformations	ACC

# CONTROLLED

We hereby certify that the above data is correct and conforms to the wrench test requirements and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries

Quality Assurance Representative

Tim West



**AIRFASCO**  
**INDUSTRIES**  
MANUFACTURER OF AEROSPACE PRODUCTS

2655 HARRISON AVE. SW  
CANTON, OH 44706  
PHONE: (330)430-6190  
FAX: (330)430-6199

**PHYSICAL AXIAL TENSILE TEST CERTIFICATION**

AFC LOT NO.: 19141      DATE MFG.: 6/10/2010      SAMPLE SIZE: 10      QTY MFG.: 49,900

PART NO.: AFC42-632L rev. 1      PROCUREMENT SPECIFICATION: NASM25027 SEP 1999

CONFORMS TO: MS21042L06 per NASM21042 OCT 1998, NAS1291-06 rev. 13

AXIAL TENSILE TEST: Method NASM1312-8 (Formerly MIL-STD-1312/8) 1,670 min. lbs. proof load inspection for nut deformation.  
Maximum load increased to failure before deformation, stripped threads or MS16997-20 test screw failure.

TENSILE SAMPLE	PROOF LOAD 1,670 LBS.	TENSILE TO FAILURE LBS.	METHOD OF FAILURE	ACCEPT REJECT
1	1,670	1,756	TEST SCREW	ACC
2	1,670	1,842	TEST SCREW	ACC
3	1,670	1,892	TEST SCREW	ACC
4	1,670	1,776	TEST SCREW	ACC
5	1,670	1,808	TEST SCREW	ACC
6	1,670	1,759	TEST SCREW	ACC
7	1,670	1,824	TEST SCREW	ACC
8	1,670	1,890	TEST SCREW	ACC
9	1,670	1,851	TEST SCREW	ACC
10	1,670	1,879	TEST SCREW	ACC
low		1,756		ACC
avg.		1,828		ACC
high		1,892		ACC

**CONTROLLED**

We hereby certify that the above data is correct and conforms to the tensile test requirements and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries  
Quality Assurance Representative:   
Tim West



# AIRFASCO

## INDUSTRIES

MANUFACTURER OF AEROSPACE PRODUCTS

2655 HARRISON AVE. SW  
CANTON, OH 44706  
PHONE: (330)430-6190  
FAX: (330)430-6199

### METALLURGICAL EXAMINATION

AFC LOT NO.: 19141      DATE MFG.: 6/10/2010      SAMPLE SIZE: 10      QTY MFG.: 49,900

PART NO.: AFC42-632L rev. 1      PROCUREMENT SPECIFICATION: NASM25027 SEP 1999

CONFORMS TO: MS21042L06 per NASM21042 OCT 1998, NAS1291-06 rev. 13

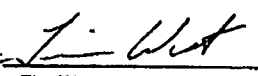
**MICRO EXAMINATION:** The microstructure shows tempered martensitic grains. No decarburization or carburization was noted visually under 100X magnification. Mount shows flow lines are continuous and follow the general contour of the part as formed by the cold forming process. No indications of cracks, laps, seams or other defects were noted. Rockwell hardness HRC, Superficial 15-N, and Tukon micro-hardness Knoop / Vickers scale was performed. Material as mounted and inspected is satisfactory as inspected and conforms to specification requirements.

HARDNESS SAMPLE	HRC	15-N	KNOOP	VHN	ACCEPT REJECT
1	39	79.9	391	382	ACC
2	40	80.4	402	392	ACC
3	40	80.4	402	392	ACC
4	39	79.9	391	382	ACC
5	39	79.9	391	382	ACC
6	40	80.4	402	392	ACC
7	39	79.9	391	382	ACC
8	40	80.4	402	392	ACC
9	40	80.4	402	392	ACC
10	40	80.4	402	392	ACC
low	39	79.9	391	382	ACC
avg.	40	80.2	398	388	ACC
high	40	80.4	402	392	ACC

# CONTROLLED

We hereby certify that the above data is correct and conforms to the tensile test requirements and that the fasteners have been manufactured and inspected in accordance with Airfasco Industries quality requirements.

Airfasco Industries

Quality Assurance Representative: 

Tim West

## INSPECTION CERTIFICATE



DONGBU STEEL CO., LTD.

CERTIFICATE NO. : 990121003

DATE OF ISSUE : 99 03 17

P / O NO. : TS 963

C U S T O M E R : KUMI OIL &amp; GAS PARTNERS

PACKING : P.P. PAPER : P.P. QUMI

•HEAD OFFICE : 157-27, SAMSUNG-DONG, KANG NAM-GU, SEOUL, KOREA

•POHANG WORKS: 792-1, GOIDONG-DONG, POHANG-CITY, KYUNG SANG BUK-DO, KOREA

•Phone: 82-562-85-2121-4

•FAX: 82-562-86-0409

## 1. COMMODITY &amp; QUANTITY

FILE NO.	COMMODITY	DIMENSION			BUNDLE NO.		QHS	WEIGHT		HEAT NO.	REMARKS
98120683A	AISI 474M SA AMS 6322K, AMS 2301G MIL-S-6028A ASTM A-574-92A	5.40	MM		10	13	4	16,573	KGS	UX177	WELDABILITY RESULT 5/16" INCH 52.0 8/16" INCH 47.0 10/16" INCH 45.0

## 2. CHEMICAL COMPOSITION (%)

C	Si	Mn	P	S	Cu	Ni	Cr	Mo	Sol-Al	Pb	B	Ti	Bi
x100			x1000		x100				x1000	x100	x10000	x1000	x100
41	26	90	15	5	4	5	49	24					

## 3. PHYSICAL PROPERTY

T N/A 1.1N/mm <sup>2</sup>	S M-Mpa P-FBI	EL (%)	R.A (%)	HARDNESS A-HR 5 HRS QUTED	SA (%)	D.M.F A-B 1 INCH	D.M.T A-B 1 INCH	GRAN DEPTH A-B 1 INCH	GRAIN SIZE	COATING WEIGHT (lb/ft <sup>2</sup> )	CLEAN- LINESS (%)	WELD STRUCTURE	UPSET RATIO (%)	REQUIREMENT
P 83,642 Y.S. P 75,277	84,780 76,302	19.5 22.5	70.9 75.8	0.0	80	NON	NON	NON	7.5	10	11	P-0.08 S-0.05	80 OR BETTER	R E S U L T

THIS IS TO CERTIFY THAT THE COMMODITY MENTIONED HEREUNDER HAS BEEN DULY INSPECTED BY OUR INSPECTION DEPARTMENT AND UP TO THE PURCHASERS REQUIREMENTS.

CHIEF OF QUALITY  
CONTROL SECTION

Geon tae Ji

PQ - QA - 022(380x280mm) 1994. 5. 1 APPROVAL

DONG BU STEEL CO., LTD

CONTROLLED

# **BRITE METAL**

## **CERTIFICATION OF PROCESS**

**CUSTOMER:** AIRFASCO INDUSTRIES, INC  
2655 HARRISON AVE SW  
CANTON OH 44706

**THIS IS TO CERTIFY THAT BRITE METAL INC. HAS PROCESSED THE FOLLOWING  
MATERIAL IN ACCORDANCE WITH THE MOST WIDELY ACCEPTED  
METALLURGICAL PROCEDURE.**

**PO #:** 22602      **WEIGHT:** 35 LBS      **NO. BIN:** 1      **NO. PCS:** 49,000  
**PN#:** AFC42-632-8740 NUT AFC      **LOT#:** 19141      **BM ORDER NO:** 152903  
**HEAT#:** CK177      **MTL#:** 8740      **CORE HARD SPECS:** HRC 37-42  
**DATE RECEIVED:** 02/16/10      **DATE SHIPPED:** 2/19/10  
**SPECIFICATION:** MIL-H-6875H

### **HEAT TREATING TEST RESULTS**

**NUMBER OF SAMPLES:** 10  
**CORE HARDNESS:** RC 39.5/40  
**SURFACE HARDNESS:** N/A  
**CASE DEPTH:** N/A  
**CORE HARDNESS AS QUENCHED:** N/A

# **CONTROLLED**

**INSPECTOR:** RS

**DATE:** 2/19/10

# LAKE CITY

1701 Lake Avenue - Ashtabula, Ohio 44004 • 440-964-3555 • FAX 440-964-2399

WWW.LAKECITYPLATING.COM

March 8, 2010

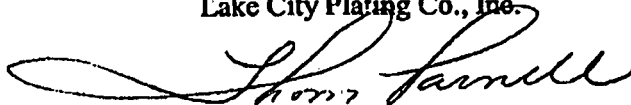
AirFasco Industries  
2655 Harrison Avenue SW  
Canton, OH 44706-3047

Subject: Part No. AFC 42-632-8740  
P. O. No. 22627  
Delivered on 3/8/10

## "CERTIFICATE OF COMPLIANCE"

We hereby certify that the above parts were cadmium and black chromate per spec. AMS-QQ-P-416C, Type 2, Class 2 plus baked for 23 hours with .0003" thickness.

Lake City Plating Co., Inc.



Thom Parnell  
Plant Manager

<b>AIRFASCO</b>
LOT # <u>19141</u>
WT <u>35 lbs</u> QTY <u>49,000</u>

79451

<b>RECEIVED</b>
MAR 15 2010
BY: <u>Gordon</u>

# CONTROLLED

# EVERLUBE PRODUCTS

## TEST REPORT

DATE: 6/01/2009  
PRODUCT: Everlube® 620C  
SPECIFICATION: SAE AS5272C, Type I  
BATCH NUMBER: PC-10332  
DATE OF MANUFACTURE: 6/01/2009  
MANUFACTURING SITE: Peachtree City, GA  
TEST REPORT NUMBER: 09-0136  
CUSTOMER P.O. #: 40923

DATE OF EXP.

JUN 22 2010

## TEST RESULTS

PARAGRAPH	TEST	REQUIREMENTS	RESULTS
3.3	Film Appearance	Pass	Pass
3.3	Film Thickness	All Specimens 0.0003" - 0.0005" with no single readings less than 0.0002" or greater than 0.0007".	All Specimen 0.0003" - 0.0007"
3.4.1	Film Adhesion (ASTM D-2510, Procedure A)	Pass	Pass
3.4.4	Endurance Life (ASTM D-2625, Procedure A)	Per Spec 250 Min. Avg. None < 210 Min.	Test # 1 = 340 Min. Test # 2 = 385 Min. Test # 3 = 300 Min. Test # 4 = 343 Min. Average = 343 Min.
3.4.5	Load Carrying Capacity (ASTM D-2625, Procedure B)	2500 Lbf. Avg. None < 2250 Lbf.	Average = 543 Min. Test # 1 = 2750 Lbf. Test # 2 = 2750 Lbf. Average = 2750 Lbf.
3.4.7	Sulfurous Acid-Salt Spray	Pass 4 Cycles	Pass
3.4.9	Solids Content	40% Minimum	42.9%

## CERTIFICATE OF CONFORMANCE

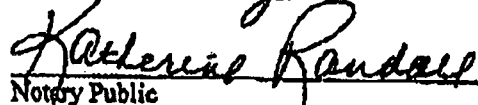
EVERLUBE PRODUCTS HEREBY CERTIFIES THAT THIS PRODUCT CONTAINS NO GRAPHITE OR POWDERED METALS AND HAS BEEN EVALUATED AGAINST THE QUALITY CONFORMANCE REQUIREMENTS OF SAE AS5272, TYPE I, AND CONFORMS TO THE REQUIREMENTS OF THAT SPECIFICATION.

CERTIFIED BY:



Tim Murphy  
Quality Assurance Technician  
Carl H. Van Acker  
Quality Assurance Manager

Sworn to and subscribed before me  
This 1 day of June, 2009

  
Notary Public

# CONTROLLED

Everlube Products • 100 Cooper Circle • Peachtree City, GA • 30269-7989 USA  
Phone 770-261-4800 • Fax 770-261-4805 • [www.everlubeproducts.com](http://www.everlubeproducts.com) • [customerservice@everlubeproducts.com](mailto:customerservice@everlubeproducts.com)

# AIRFASCO INDUSTRIES

## CANTON, OHIO

QS-010  
Rev. 0  
2/09

### Final Inspection


Lot #: 19141	Part #: MS21042L06	Date: 5/18/10
Description: SELF-LOCKING NUT	Rev. OCT 1998	Plated? (Y or N): Y
Inspector: T.WEST	Head ID: N/A	HRC? (Y or N): Y

### Record Measured Value

#	Characteristic	Max	Min	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
1	Diameter	.244	.214	.237/.238	.235/.237	.235/.237	.235/.236	.235/.236
2	Thickness	.141	.115	.135	.134	.135	.135	.134
3	Flats B.C.	.190	.181	.188/.188/.188	.187/.188/.188	.186/.187/.187	.187/.187/.187	.186/.187/.188
4	Flats A.C.	.190	.181	.182/.187/.188	.183/.187/.188	.183/.187/.188	.182/.187/.187	.183/.186/.188
5	Point-Point B.C.	*	.207	.210/.210/.211	.210/.211/.212	.211/.211/.212	.210/.210/.211	.210/.211/.211
6	Point-Point A.C.	*	.207	.207/.207/.210	.207/.208/.210	.207/.207/.211	.207/.207/.210	.208/.208/.212
7								
8								
9								
10								
11								
12								
13								
14								
15								

**Note:** Use a tri-roll for pitch diameter, a micrometer for major and body diameter, a ring gage for gage, and a caliper for all other dimensions.

Comments: Note: BC = Before Crimp, AC = After Crimp

Approved?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Quality Control Signature:		Date: 5-18-10

# CONTROLLED



# X-R-I Testing

5403 E. Schaaf Rd.  
Cleveland, OH 44131  
216-642-0100

## Nondestructive Testing Certification Magnetic Particle Inspection

09 LAIR02

AIRFASCO INDUSTRIES, INC.

2655 HARRISON AVE SW

Canton

OH

44706

Report Date: 6/4/2010

Report Number: M 6487

SO Number: 0109836

Customer PO: 41882

Part # AFC42 428 4037, AFC42 632 8740, AFC42 632 4037, AFC42 832 4037,

Job #:

Description: AFC42 1032 4037,

Qty Parts: 171.00

Serial #/ Lot #: NUTS

### Inspection performed in accordance with:

MAG PARTICLE INSPECTION PER: ASTM-E1444-05 / XRI 6004 Rev. 2.3 (11-13-09)

ACCEPTANCE: NO CRACKS

PN: AFC42 428 4037 LOTS: 19588, 19582

AFC42 632 8740 LOTS: 19135, 19141, 19129, 19123, 19117  
19568, 19562

AFC42 632 4037 LOT: 19570

AFC42 1032 4037 LOT: 17932, 19551, 19555, 19559

AFC42 832 4037 LOT: 19522, 19527, 19532

Qty Inspected: 171.00

Qty Accepted: 171.00

Qty Rejected

0.00

Cause for Rejection/Comments:

N/A

# CONTROLLED

**AIRFASCO**

LOT # 19141

WT 35 lbs QTY 49,000

**RECEIVED**

JUN 10 2010

BY: Gordon

This certificate or report shall not be reproduced except in full, without the written approval of the laboratory. The recording of false, fictitious or fraudulent statements or entries on this document may be punished as felony under federal statutes including federal law Title 18, Chapter 47.

Inspector: Robert Custer

Level: II Stamp: M19

700 N. Centennial  
Zeeland, MI 49464  
616-772-4300

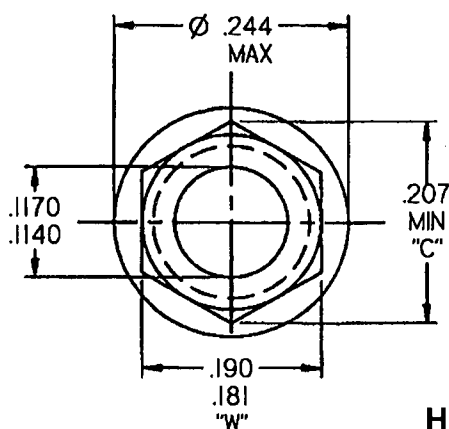
5403 E. Schaaf Rd.  
Cleveland, OH 44131  
216-642-0100

1961 Thunderbird St.  
Troy, MI 48084  
248-362-5050

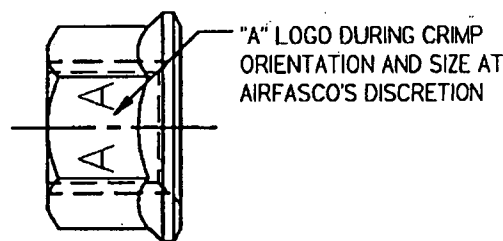
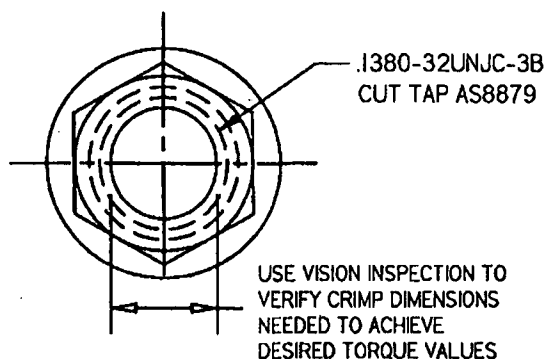
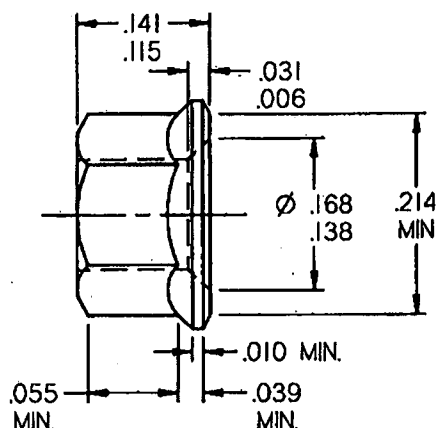
6653 SE Crosswhite Way  
Portland, OR 97206  
503-777-9696

785 Norwood Circle  
Hampton, VA 23661  
757-722-5730

201 Forrest Dr. Ste. A-1  
Greenville, SC 29607  
864-627-8523



### HEADED BLANK



### FINISHED PART

#### DESIGN NOTES:

1. PERFORMANCE TO NASM25027 EXCEPT INCREASED AXIAL TENSILE 1,670 LBS.
2. MATERIAL: ALLOY STEEL UNS G40370 (AISI 4037) PER AMS6300 OR UNS G87400 (AISI 8740) PER AMS6322.
3. HEAT TREATMENT PER AMS-H-6875A, HRC 37-42, HRC 49 MAX. PER NASM21042
4. FINISH: CADMIUM PLATED PER AMS-QQ-P-416C, TYPE 2, CLASS 2, BAKE 23 HOURS 375 F WITHIN 1 HOUR OF PLATING.
5. ADD "L" TO BASIC AIRFASCO PART NUMBER FOR POST LUBE PER SAE AS5272C, TYPE 1 AND BAKE 1 HOUR 375F.
6. "C" AND "W" DIMENSIONS APPLY BEFORE FORMING SELF LOCKING FEATURE.
7. STANDARD TORQUE PER NASM25027, 1 IN-LBS MIN. TO 10 IN-LBS MAX.
8. ADD "LT" TO BASIC AIRFASCO PART NUMBER IF LIGHT TORQUE IS REQUIRED, 1 IN-LBS MIN. TO 5 IN-LBS MAX. RECOMMENDED FOR USE WITH ALL FASTENERS WITH 125,000 PSI. AND LOWER TENSILE STRENGTH.
9. 100% VISION INSPECTION C=0, 0/PPM POST PLATE AND PRIOR TO WAX OR DRY FILM LUBE FOR ALL DIMENSIONS, HOLE PRESENCE, THREADS, SELF LOCKING FEATURE, CRACKS, PLATING AND FOREIGN MATERIAL.
10. TEST BOLTS MS16997-20, 180,000 PSI MIN. REDUCED MAJORS.
11. THREADS BEFORE LUBRICATION PER AS8879.
12. BEARING SURFACE ROUGHNESS AVERAGE NOT TO EXCEED 125 MICROINCHES IN ACCORDANCE WITH ASME B46.1.

#### EXAMPLE PART NUMBER

AFC42 - 632 L

POST LUBE  
THREAD SIZE  
BASIC PART NUMBER



ACTUAL SIZE

## UNCONTROLLED

CONFORMS TO: NASM21042L06, MS21042L06 AND NAS1291-06  
SUPERCEDES: AN363, AN364, AN365, MS20364, MS20365, MS21044  
INTERCHANGABILITY:

① ADDED 100% VISION INSPECTION, SEE NOTE 9.

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES AND TOLERANCES ARE AS SHOWN BELOW. DIMENSIONAL TOLERANCES AND SYMBOLS PER ANSI Y14.5M-1982

PROPRIETARY PARTS SHOWN IN THIS DRAWING ARE THE SUBJECT OF ISSUED UNITED STATES AND FOREIGN PATENTS AND PATENTS PENDING. UNAUTHORIZED REPRODUCTION AND/OR DISTRIBUTION OF THIS DRAWING IS STRICTLY PROHIBITED.

APPROVALS		DATE
ANGLES	±1°	DRAWN C.D. 7/30/08
XX	±.03"	CHECKED D.D. 7/30/08
XXX	±.010"	ENG APPR D.D. 7/30/08
XXXX	±.001"	MGR APPR D.D. 7/30/08

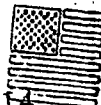
## AIRFASCO INDUSTRIES

FASTENER GROUP, 2655 HARRISON AVE. SW, CANTON, OHIO USA

PART NUMBER:	AFC42 - 632L LOCK NUT	REV 1
SIZE A	DESCRIPTION: NUT, SELF LOCKING 450°F	WEIGHT: .0008 / EACH LBS.
SCALE: 4:1	DRAWING NUMBER: AFC42-632L	SHEET 1 OF 1

**LFC** industriesA Division of RKR Technologies, LTD  
manufacturer of precision aerospace fasteners1221 Corporate Dr. W • P.O. Box 5982  
Arlington, Texas 76006 (817) 640-1322**SHIPPING  
REPORT**

51034

PRODUCTION ORDER # 51034  
COUNTRY OF ORIGIN: USAEAST COAST AVIATION  
399 EAST DRIVE  
MELBOURNE, FL 32904**COMMENTS**DFAR 252.225-7014  
ALTERNATE 1 COMPLIANTRETURN OF ANY MERCHANDISE LISTED HEREON WILL NOT  
BE ACCEPTED WITHOUT PRIOR AUTHORIZATION**CERTIFICATE OF CONFORMANCE**

THE MATERIALS, PROCESSES AND PARTS FURNISHED WERE PRODUCED IN ACCORDANCE WITH APPLICABLE SPECIFICATION REQUIREMENTS, AND TEST REPORTS INDICATING CONFORMANCE ARE ON FILE SUBJECT TO EXAMINATION. OUR Q.C. INSPECTION SYSTEM CONFORMS TO ISO 9001.

  
SIGNED

BITOL

SHTOP

SHIPPING METHOD	YRC
PRE-PAID:	COLLECT <input checked="" type="checkbox"/>
ORDER NO.	59446
PART NO.	MS27039-1-24 ITEM# 6
REVISION	3
QTY. DUE	25000
SHIP TOL.	+0-5%
DATE DUE	05-15-2012

PARTIAL ☐COMPLETE ☒QTY.  
SHIPPED:

25000

QTY.  
CONTAINERS:

13

LBS. PER "M":

.014

GROSS  
WEIGHT:

365.5

PCS. USED TO  
ESTABLISH WT.

25

TARE  
WEIGHT:

13.0

NET  
WEIGHT:

352.5

SHIPPING  
CLERK:

RL

DATE

5-15-12

CONSIGNEE  
SIGNATURE:

DATE

EECN: EAR99, SCHEDULE B #7318.15, 2000

LFC INDUSTRIES, DIV. OF RKR TECHNOLOGIES LTD.  
1221 CORPORATE DR. W., ARLINGTON, TX 76006  
(817) 640-1322 FAX (817) 652-1566

LFC IND. CAGE CODE # 62384, CERTIFICATION - FASTENERS IN THIS LOT WERE  
MANUFACTURED, PROCESSED AND INSPECTED IN ONE RUN PER APPLICABLE  
DRAWING, PROCUREMENT SPECIFICATION, ISO9001:2008, AND AS9100B.

<b>PART #</b> MS27039-1-24		<b>REVISION</b> 3		<b>LOT #</b> 51034		<b>CUSTOMER</b> EAST COAST		<b>PO #</b> 59446	
<b>QUANTITY</b> 25000		<b>PROCUREMENT SPECIFICATION</b> NASM7839 REV-1		<b>HEAT TREAT SPECIFICATION</b> AMS-2759/1		<b>DESCRIPTION</b> SCREW, PAN HEAD			
<b>FINISH TYPE</b> TYII CL2		<b>FINISH SPECIFICATION</b> AMS-QQ-P-416C		<b>BAKE</b> N/A		<b>CROSS RECESS</b>			
<b>THREAD SIZE</b> 10-32 UNF3A		<b>THREAD SPECIFICATION</b> H28/2		<b>HARDNESS REQUIRED</b> RC 26-32		<b>HARDNESS ACTUAL AVERAGE</b> RC 30			
<b>NDT SAMPLE SIZE</b> N/A		<b>NDT SPECIFICATION</b> N/A		<b>NDT ACCEPT</b> N/A		<b>NDT REJECT</b> N/A		<b>LOCKING ELEMENT SPECIFICATION</b> N/A	
<b>MAGNETIC PERMEABILITY SAMPLE SIZE</b> N/A		<b>PERMEABILITY ACCEPT</b> N/A		<b>PERMEABILITY REJECT</b> N/A					
<b>RECESS TORQ SAMPLE SIZE</b> N/A		<b>MINIMUM TORQ REQUIRED</b> N/A		<b>TORQ END LOAD</b> N/A		<b>TORQ ACCEPT</b> N/A		<b>TORQ REJECT</b> N/A	

CHEMICAL COMPOSITION ON CERTIFIED MILL TEST REPORT									
<b>MILL HEAT #</b> 8076629		<b>MATERIAL SPECIFICATION</b> AMS6322N			<b>MATERIAL GRADE</b> 8740			<b>SUPPLIER</b> TREE ISLAND	
<b>C</b>	<b>Mn</b>	<b>P</b>	<b>S</b>	<b>Si</b>	<b>Ni</b>	<b>Cr</b>	<b>Mo</b>	<b>Cu</b>	<b>V</b>
0.40	0.86	0.0120	0.0120	0.26	0.43000	0.48	0.20	0.12	
<b>B</b>	<b>Ti</b>	<b>Al</b>	<b>Co</b>	<b>Pb</b>	<b>Fe</b>	<b>Sn</b>	<b>Zn</b>	<b>N</b>	<b>Mg</b>

TENSILE SAMPLE SIZE				TENSILE STRENGTH REQUIRED				DOUBLE SHEAR SAMPLE SIZE				D. SHEAR STRENGTH REQUIRED			
20				2500#				20				4250#			
T1	3280	T12	3260	T23		S1	5040	S12	5100	S23					
T2	3260	T13	3260	T24		S2	5100	S13	5040	S24					
T3	3340	T14	3280	T25		S3	5060	S14	5100	S25					
T4	3320	T15	3260	T26		S4	5080	S15	5060	S26					
T5	3340	T16	3340	T27		S5	5040	S16	5080	S27					
T6	3260	T17	3320	T28		S6	5100	S17	5040	S28					
T7	3280	T18	3340	T29		S7	5040	S18	5100	S29					
T8	3260	T19	3320	T30		S8	5100	S19	5040	S30					
T9	3340	T20	3340	T31		S9	5060	S20	5060	S31					
T10	3320	T21		T32		S10	5080	S21		S32					
T11	3340	T22				S11	5040	S22							

<b>FATIGUE SAMPLE SIZE</b> N/A		<b>FATIGUE MAX LOAD</b>		<b>FATIGUE MIN LOAD</b>		<b>METALLURGICAL SAMPLE SIZE</b> 20	
<b>F1 CYCLES</b>		<b>F1 LOCATION OF FAILURE</b>		<b>MICRO STRUCTURE</b>	ACCEPT	<b>MACRO STRUCTURE</b>	ACCEPT
<b>F2 CYCLES</b>		<b>F2 LOCATION OF FAILURE</b>		<b>DECARBURIZATION</b>	NONE	<b>CARBURIZATION</b>	NONE
<b>F3 CYCLES</b>		<b>F3 LOCATION OF FAILURE</b>		<b>UNTEMPERED MARTENSITE</b>	NONE	<b>GRAIN FLOW</b>	ACCEPT
<b>F4 CYCLES</b>		<b>F4 LOCATION OF FAILURE</b>		<b>DISCONTINUITIES</b>	ACCEPT	<b>DEVIATION/WAIVER NOTES</b> N/A	
<b>F5 CYCLES</b>		<b>F5 LOCATION OF FAILURE</b>		<b>CERTIFICATION AMENDMENT NOTES</b> N/A			
<b>F6 CYCLES</b>		<b>F6 LOCATION OF FAILURE</b>		<b>AMENDMENT DATE</b> 			
<b>F7 CYCLES</b>		<b>F7 LOCATION OF FAILURE</b>					
<b>F8 CYCLES</b>		<b>F8 LOCATION OF FAILURE</b>					
<b>FATIGUE ACCEPT</b>		0		<b>FATIGUE REJECT</b>		0	
<b>DATE</b> 5/15/2012		<b>SIGNATURE TITLE</b> DATA ENTRY SPECIALIST		<b>AUTHORIZED SIGNATURE</b> <i>Elaine Quaver</i>			





PAULO  
PRODUCTS  
COMPANY

HEAT TREATERS  
AND FINISHERS  
OF METAL

4827 CHELSEA AVENUE  
KANSAS CITY, MO 64130  
TEL: (816)861-7500  
FAX: (816)924-7300

## CERTIFIED INSPECTION REPORT

S  
O  
L  
D  
I  
D  
O  
L F C INDUSTRIES  
1221 CORPORATE DRIVE WEST  
P O BOX 5982  
ARLINGTON, TX 76006-5982

PAULO #: 1082674-01  
DATE: 03/09/2012  
DATE REC'D: 02/29/2012  
SHIP TO CODE:

PART DESC: CROSS SECTION .1882 C 1.563L  
PART NAME: SCREW, PAN HEAD  
PART #: MS27039-1-24  
QUANTITY: 27200 PCS  
MATERIAL: 8740

CUSTOMER PO: 51034  
CUSTOMER DRAY:  
CUSTOMER JOB:  
LOT #:  
OTHER #:

Requirements:  
Process per SAE spec AMS 2759/1 rev E,  
Final core hardness 29-32 HRC

### INSPECTION RESULTS:

CORE HARDNESS  
Count: 13  
Range: 29 -31 HRC

Certified Furnace # 501 Cycle/Load # 5  
High heat temp: 1550±25° F Soak time: 60min  
Quench: Oil  
Temper furnace: 531 Temper temp/time: 1080±15° F/ 2hrs

\*Paulo is responsible for hardness testing only, customer responsible for all other testing. Paulo is not responsible for tensile testing\*

I CERTIFY THAT APPLICABLE MATERIAL PROCESSES HAVE BEEN PERFORMED IN ACCORDANCE WITH THE SPECIFICATION SHOWN ABOVE.  
I HAVE INSPECTED THE WORK AND THE SAMPLING AND RESULTS ARE AS INDICATED.

Approved By

Inspector Signature

CERTIFICATION  
REVIEWED  
ACCEPT  
LFC  
4

# TI Wire

A Division of Tree Island Wire USA, Inc.  
12459 Arrow Route, Etiwanda, CA 91729  
Phone (909) 899-1673 Fax (909) 899-4533

## Mill Certificate

Order No : 302953  
Sold To : LFC Industries PO Box 5982 Arlington TX  
Cust Po# : 14618  
Product : 160127 -AQR .1870 8740 SAIP Phos 90Max 350#CL/1000#STM WR Quantity/Heat : 10630 LB

### MECHANICAL PROPERTIES:

Tag#	Dia "	T ksi
15473172		
15473174		
15473176		
15473178		
15473179		
15473181		
15473182		
15473186		
15473188		
15473191		
15473192		
15473193		
15473194		
15473197		
15473201		
15473203		
15473204		
15473207		
15473208		
15473209		
15473213		
15473223		
15473224		
15473227		
15473230		
15473231		
15473234		
15473237		
15473238		
15473240		
15473242		
15473245		
15473250		
15473252		
Average Values	.1873	85.265

CERTIFICATION  
REVIEWED  
ACCEPT  
LFC  
4

### CHEMICAL PROPERTIES: Mill / Country: REPUBLIC STEEL, USA

HEAT#	dcarb	GRAIN	Pdcarb	%C	%Mn	%P	%S	%Si
8076629	0.0000	8.	.0000	0.40	0.86	0.0120	0.0120	0.26
	%Cu	%Ni	%Cr	%Mo				
	0.12	0.43000	0.48	0.20				

### MILL DATA:

HEAT#	J5	J8	J10	macrS	macrR	macrC	inclF	inclS	micro
8076629	53	45	38	1	1	1	0.00	0.00	Pass

### SPECIFICATIONS:

date 09-09-2011

time 12:47:40

page 1

MIL-S-6049A AMT 1, AMS 6322N, AMS 2301K, ASTM A574-11, Melt Certs Required

TI Wire certifies that the materials described herein are represented to the Buyer(Customer) as stated to TI Wire by the producing mill and attested to by said mills Test Report with respect to chemical analysis. Other properties stated herein are certified to be representative of tests performed by TI Wire with the exception of those performed by the producing mill in which case they are a restatement of the Test Report as supplied to us by the producing mill. We further certify that all of the manufacturing processes for the steel wire and wire products described above, were performed in the United States of America.

TI WIRE

SEP 08 2011

Date : \_\_\_\_\_

Authorized Official : \_\_\_\_\_

  
Kevin Cruz  
Quality Assurance



# Republic

ENGINEERED PRODUCTS

1807 EAST 28TH ST.  
PHONE: 330-438-5694

LORAIN, OH 44055  
FAX: 330-438-5695

CERTIFICATE OF TESTS

REPUBLIC ENGINEERED PRODUCTS

April 26, 2011

PAGE 1

OF 2

PURCHASE ORD: RP-263  
PART NUMBER: 98G#R  
ORDER NUMBER: 1471762 - 01  
HEAT: 8076629

PURCHASE ORDER DATE: 12/16/2010  
ACCOUNT NUMBER: 6334-4016-01  
SCHEDULE: 0896-90  
REVISION: 1

===== CHARGE ADDRESS =====

SHIP TO =====

TREE ISLAND WIRE USA INC  
12459 ARROW ROUTE  
ETIWANDA, CA 91739

TREE ISLAND WIRE USA INC  
bruce yost  
C/O INDUSTRIAL ALLOYS  
3880 W VALLEY BLVD  
POMONA, CA 91768

### MATERIAL DESCRIPTION

HOT ROLLED STEEL COILS ALLOY ASTM A322-07 FG AMS 2301K AMS 2304B REVISION DTD 08-10 INDUSTRIAL WIRE PRODUCTS SPEC 98X#R 8740AQR REVISION 1 DTD 02/27/04 AMS 6322N AMS S 6049 COND C-2 EXC MARK & UT EF-AISI-8740 FINE GRAIN VACUUM DEGASSED AIRCRAFT QUALITY COLD WORKING QUALITY SPHERODIZE ANN CLEANED & ZINC PHOSPHATE COAT NEUTRALIZE & LIGHT LUBE

SIZE: RDS .3130 DIAM X COIL  
RDS 7.9502MM DIAM X COIL

### LADLE CHEMISTRY %

C	MN	P	S	SI	CU	NI	CR
0.40	0.86	0.012	0.012	0.26	0.12	0.43	0.48
V	MO	SN	AL	CB	N		
0.004	0.20	0.007	0.030	0.001	0.0084		

### CALCULATED TESTS

REDUCTION RATIO 1,690.4 TO 1

AUSTENITIC GRAIN SIZE 5 OR FINER BASED ON A TOTAL ALUMINUM CONTENT EQUAL TO OR GREATER THAN .020% PER ASTM A29.

### SEMI - FINISHED RESULTS

JOMINY HARDNESS TEST SAE J406/ASTM A255

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 18 20 22 24 26 28 30 32  
57 56 55 54 53 51 49 45 42 38 36 34 33 31 31 29 29 28 28 27 27 26 26 26

MACRO ETCH TEST ASTM E381/MIL STD 430

ETCHANT: HCL TEMPERATURE: 170

	S	R	C
AVG	1	1	1

MAGNETIC PARTICLE TEST AMS 2301 AMS2304 AMS2300

	IND	AVG	IND	AVG
	FREQ	FREQ	SEV	SEV
AVG	0	0	0	0

MAGNETIC PARTICLE TEST AMS 2301 AMS2304 AMS2300

	IND	AVG	IND	AVG
	FREQ	FREQ	SEV	SEV
AVG	0	0	0	0

### FINISHED SIZE RESULTS

DECARBURIZATION TEST SAE J419/ASTM E1077/JIS G0558

ETCHANT = NITAL MAGNIFICATION = 100X

TOTAL

G. KRUTH  
DIRECTOR QUALITY ASSURANCE

BY HILDA BEGUE



# Republic

ENGINEERED PRODUCTS

1807 EAST 28TH ST.  
PHONE: 330-438-5694

LORAIN, OH 44055  
FAX: 330-438-5695

## CERTIFICATE OF TESTS

REPUBLIC ENGINEERED PRODUCTS

April 26, 2011

PAGE 2

OF 2

PURCHASE ORD: RP-263  
PART NUMBER: 98G#R  
ORDER NUMBER: 1471762 - 01  
HEAT: 8076629

PURCHASE ORDER DATE: 12/16/2010  
ACCOUNT NUMBER: 6334-4016-01  
SCHEDULE: 0896-90  
REVISION: 1

	SPIKE	COMPLETE	DEPTH
	INCHES	INCHES	INCHES
PCE 01	0	0	0

MICROSTRUCTURE TEST STANDARD FORMAT SPHERO  
ETCHANT = NITAL MAGNIFICATION = 1000X  
VALUE

### FINISHED SIZE RESULTS (CONTINUED)

PCE 01 85.0000%

TENSILE TEST STANDARD FORMAT  
TENSILE RA  
PSI %  
PCE 01 82000 61.0

HARDNESS TEST ASTM E18/ASTM A370/EN/DIN 10002 HT RKWB  
SURFACE  
PCE 01 85.0

CAPABLE OF SEAM DEPTH .003" MAX

### NOTES

CHEMICAL ANALYSIS CONFORMS TO APPLICABLE SPECS: ASTM E415, LBL10129, LBL10130, ASTM E1019, LBL10158, LBL10114, AND ASTM E1085, LBL10184, LBL10188.

REPUBLIC ENGINEERED PRODUCTS HEREBY CERTIFY THAT THE MATERIAL LISTED HEREIN HAS BEEN INSPECTED AND TESTED IN ACCORDANCE WITH THE METHODS PRESCRIBED IN THE GOVERNING SPECIFICATIONS AND BASED UPON THE RESULTS OF SUCH INSPECTION AND TESTING HAS BEEN APPROVED FOR CONFORMANCE TO THE SPECIFICATIONS.

CERTIFICATE OF TESTS SHALL NOT BE REPRODUCED EXCEPT IN FULL.

ALL TESTING HAS BEEN PERFORMED USING THE CURRENT REVISION OF THE TESTING SPECIFICATIONS.

RECORDING OF FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHED AS A FELONY UNDER FED STATUTES TITLE 18 CHAPTER 47.

THE MATERIAL WAS NOT EXPOSED TO MERCURY OR ANY METAL ALLOY THAT IS LIQUID AT AMBIENT TEMPERATURE DURING PROCESSING OR WHILE IN OUR POSSESSION.

NO WELD OR WELD REPAIR WAS PERFORMED ON THIS MATERIAL.

THE RESULTS REPORTED RELATE ONLY TO THE ITEMS TESTED

### SOURCE INFORMATION

MELT SOURCE: CANTON CAST ROLL MELT COUNTRY: U.S.A HOT ROLL SOURCE: LORAIN 9/10, U.S.A  
MELT METHOD: EF BLOOM RED. RATIO: 1690.4

END OF DATA CC END OF DATA  
FILE 1 COPY

G. KRUTH BY HILDA BEGUE  
DIRECTOR QUALITY ASSURANCE

## PLATING - PASSIVATION CERTIFICATION REPORT

**LOT #**  
51034

**CUSTOMER**  
EAST COAST

**MILL HEAT #**  
8076629

**PART #**  
MS27039-1-24

**PO #**  
59446

**HARDNESS REQUIRED**  
RC 26-32

**QUANTITY**  
25000

**FINISH TYPE**  
TYII CL2

**FINISH SPECIFICATION**  
AMS-QQ-P-416C

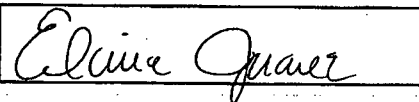
**TIME AND DATE OUT OF PLATE**  
N/A

**TIME AND DATE IN OVEN**  
N/A

**TIME AND DATE OUT OF OVEN**  
N/A

THE PARTS REFERENCED ABOVE WERE PROCESSED IN ACCORDANCE WITH ALL APPLICABLE REQUIREMENTS OF THE STATED FINISH SPECIFICATION. HYDROGEN EMBRITTLEMENT RELIEF, IF REQUIRED WAS PERFORMED AFTER PLATING AT 375 DEGREES (F), FOR A MINIMUM OF TWENTY THREE HOURS UNLESS OTHERWISE SPECIFIED. ACCEPTANCE TESTS RECORDS ARE ON FILE AT LFC INDUSTRIES AND ARE SUBJECT TO EXAMINATION UPON REQUEST.

**CERTIFICATION DATE**  
5/15/2012

**AUTHORIZED SIGNATURE:** 

**SIGNATURE TITLE**  
DATA ENTRY SPECIALIST



**Parker Hannifin Corporation**  
 O-Ring Division  
 Parker Seal de Matamoros  
 Diagonal Lorenzo De La Garza 913 Ciudad  
 M. Matamoros, Tam. 87499, Mexico  
 Phone: (859) 335-3000

— NOTICE — PAGE 1 OF 1  
**This is a C.B.I. Compound!**

C.B.I. is Parker's exclusive quality assurance program for Controlled Batch Identification, your assurance of reliability.



### CONFORMANCE CERTIFICATE FOR MATERIAL SHIPPED

Parker O-Ring Division certifies that the material used in the manufacture of the parts identified below and called for on Purchase Order Number SF4LB6XNA received by us from WENCOR WEST INC is traceable to C.B.I. Number 0080255706 and that the material used conforms to the requirements of the specifications indicated below. The tests were performed in accordance with these specifications, and data supporting the indicated results are on file.

P.O. ORDER NUMBER		P.O. ORDER NUMBER		P.O. ORDER NUMBER		P.O. ORDER NUMBER	
MS29512-06		A5315-906		N0402 -70		5025 4014 12/11/14	
SPECIFICATION		REV		LOT		TESTED	
ANS-P-5315		B		C0859245		ON: 12/09/14	
TEST RESULTS				REQUIREMENTS		PARKER FINDINGS	
				MIN	MAX		
ASTM D297	HYDROSTAT	SPECIFIC GRAVITY		1.24	1.28	1.24	
ASTM D2240	SHORE A	HARDNESS		60	70	64	
ASTM D1414		TENSILE STRENGTH, PSI		1000		1692	
ASTM D1414		ELONGATION %		200		386	
FLUID TESTING							
ASTM D1414	ASTM D471	FUEL A	72 HRS @ 73F	0	10.0	2.0	
ASTM D1414	ASTM D471	FUEL B	72 HRS @ 73F	0	50.0	24.0	
				PASS		PASS	

Testing Performed by PSDM Lab  
 Diagonal Lorenzo De La Garza 913 Ciudad  
 M. Matamoros, Tam. 87499, Mexico

CASE CODE: SE397

No Mercury, Mercury compounds or Mercury bearing instruments, equipment or apparatus which might cause contamination has been used in the manufacture or subsequent processing of material covered by this order.

Purchaser use only. Reproduce only in full. Data pertains to items referenced.

The recording of false, fictitious or fraudulent statements or entries on the certificate may be punishable as a felony under Federal law.

The information contained herein is submitted as the privileged and confidential property of the Parker Hannifin Corporation pursuant to 5 U.S.C. Section 552 (b)(3) and (b)(4), the Freedom of Information Act, exemption Number 3 and Number 4. This information shall not be duplicated, used or disclosed in whole or in part outside the recipient organization without express written consent of the Parker Hannifin Corporation.

O-Ring Division  
**PARKER HANNIFIN CORPORATION**

By

RUBEN RAMIREZ  
 Quality Assurance Manager

MAIL REMITTANCE TO:  
Parker Hannifin Corporation  
(859) 269-2351

O-ring Division  
Parker Hannifin Corporation  
(For Correspondence Only)  
P.O. Box 11761  
Lexington KY 40512-1761  
D.U.M.S. 06-682-6607



PACKING LIST  
980588



Carrier Signature

ATTENTION  
CARRIER:

Send all PREPAID freight bills with a copy  
of the EC of Lading for PAYMENT to  
Parker Hannifin Corporation  
c/o William & Associates, Inc.  
400 East 75th Street  
Bloomington, MN 55420-1298

PAGE 1

DATE SHIPPED  
12/11/14

F.O.B.

SHIP VIA

C

PREFERRED SHIPP # 114150584

# BOXES

WEIGHT

TRACKING NUMBER

BIN  
140

BAGS  
1

AIAG  
AIAG

ASN

\* NOT BEFORE \*

THURSDAY

MASTER SHIP# 981182

SOLD TO: 959691

WENCOR WEST INC  
P O BOX 514  
SPRINGVILLE UT 84663-0514

SHIP TO: 000

WENCOR WEST INC  
1625 N MOUNTAIN SPRINGS PKWY  
PO BOX 514  
SPRINGVILLE, UT 84663-0514

SPECIAL SHIPPING INSTRUCTIONS

1. 1-50 FXP SAVER ACCT # 114150584
2. >50 LBS FXP SAVER ACC 180942467

\*\* SPECIAL REQS \*\*  
CURE DATE REQD

SHIPPING COMMENTS

MUST SHIP IN PARKER BAGS WITH PARKER LABELS  
REFERENCE NUMBER: FLI Special Instructions  
NOTE DESCRIPTION: MESSAGE

ITEM: 0001

SO/ITM: 437997/0003 PO: SF4LB6XNA

ORD QTY: 14000

PART#: N0602 A5315-906

B/O QTY: 250 REQ DATE: 12/04/14

CUST PART: MS29512-06

SHIPPED QTY: 5025

BATCH: 0080235706 LOT: C0859265 CURE: 4Q2014 BATCH QTY: 5025 COO: MX

HARD(SHORE A): 0066 TENS(PST): 1541 ELONG(x): 0320 S.G.: 1.2600 MOD(PST): 0398

DESCRIPTION: SEAL

Parts must be no older than 4 yrs unless authorized. Cure d  
etc must be supplied on packaging and paperwork of parts.

REFERENCE NUMBER: A57350

\*\* CURE DATE RESTRICTIONS \*\*

SUPPLEMENTARY DOCS

WENCOR LLC  
RECEIVED  
DEC 16 2014

SERVICES WERE PERFORMED IN ACCORDANCE WITH QA POLICY MANUAL, REVISION 26, 11/12/13  
PARTS WERE 100% VISUALLY INSPECTED

PACKING LIST AND CERTIFICATION OF COMPLIANCE

No Mercury, Mercury compounds or Mercury bearing instruments, equipment or apparatus which  
might cause contamination has been used in the manufacture or subsequent processing of material  
covered by this order.

We hereby certify that these goods were produced in compliance with all applicable requirements of  
section 6, 7, and 12 of the Fair Labor Standards Act, as amended, and of regulations and orders of  
the United States Department of Labor issued under section 14 thereof.

Parker O-Ring Division certifies that this product conforms to specifications and requirements of the  
above Purchase Order. Material used in the manufacture of the parts identified above is traceable to  
the listed Control Batch Identification (number). The applicable test information is available for  
inspection at our facility.

By:   
RUBEN RAMIREZ - QUALITY ASSURANCE MANAGER

CLAIMS FOR DAMAGES MUST BE MADE WITHIN 30 DAYS

# Wencor, LLC

P.O. Box 514  
1625 North Mountain Springs Parkway  
Springville, UT. 84663-0514  
Phone: (801)489-2000 Fax: (801)489-2199  
sales@wencor.com

Date: 2/13/15  
Page: 1

PACKING LIST  
CERTIFICATE OF CONFORMANCE  
NUMBER: B3QZXTO

PO :		Inv.:							
CUSTOMER P.O. #	SHIP VIA	TERMS	BILL OF LADING NUMBER	WEIGHT	CARTONS	SALES REPRESENTATIVE			
74046FL	UPS	N30	1Z8426910342251137	6.00	1	Lizette Rivero			
Ship To: EAST COAST AVIATION SUPPL 399 EAST DRIVE MELBOURNE, FL 32904				Account # ECA750				Bill To: EAST COAST AVIATION SUPPLIES ATTN: ACCOUNTING 399 EAST DRIVE MELBOURNE, FL 32904 321-727-0047	
Ship Line Num.	Part Number	Description	Quantity Ordered	Quantity This Shipment	Quantity Backorder	Manufacturer CAGE	Batch Number	Manufacture, Lube, Cure or Expiration Date	Document Control Number
1	AN310-9	<b>ACCEPTED</b> NUT, PLAIN, CASTELLATED	100	99 <i>dc</i> 100		27687	0507105-020	- GLEER PARKER	D37162
2	AS3084-03	<b>ACCEPTED</b> PACKING PREFORMED 'O' RIN	100	100 <i>dc</i>		02697	0080182830	- Cure 2q2012 PARKER	D71888-B
4	MS28775-115	<b>ACCEPTED</b> PACKING, PREFORMED O RING	250	250 <i>dc</i>		02697	0081016696	- Cure 4q2014 PARKER	G03166-B
5	MS29512-06	<b>ACCEPTED</b> SEAL	1000	1000 <i>dc</i>		02697	0080235706	- Cure 4q2014 PARKER	F98326

packlist07/01/01

WE CERTIFY THAT THE ITEMS FURNISHED ON THIS ORDER CONFORM TO THE SPECIFICATIONS AND REQUIREMENTS DETAILED IN THE CONTRACT OR PURCHASE ORDER. EVIDENCE OF SUCH CONFORMANCE IS ON FILE WITH US OR OUR SUPPLIERS (SUBJECT TO EXAMINATION).

UNLESS SPECIFIED ABOVE, ITEMS ARE IN NEW, UNUSED CONDITION, ARE TRACEABLE TO APPROVED SOURCES (FAA, MIL-SPEC, OR COMMERCIAL) AND HAVE NOT BEEN OBTAINED FROM ANY U.S. GOVERNMENT OR MILITARY SOURCE.

WHILE STORED WITHIN OUR FACILITY, PRODUCTS ARE NOT EXPOSED TO MERCURY.

INSPECTOR



IT IS YOUR RESPONSIBILITY TO OBTAIN A VALIDATED EXPORT LICENSE FOR THIS MATERIAL FROM THE DEPARTMENT OF STATE OR THE DEPARTMENT OF COMMERCE IF SO REQUIRED UNDER THE APPLICABLE U.S. GOVERNMENT EXPORT CONTROL REGULATION. THE ABOVE MATERIAL IS NOT TO BE SHIPPED TO ANY COUNTRY THAT HAS AN EMBARGO PLACED ON IT BY THE U.S. GOVERNMENT.

# Wencor, LLC

P.O. Box 514  
1625 North Mountain Springs Parkway  
Springville, UT. 84663-0514  
Phone: (801)489-2000 Fax: (801)489-2199  
sales@wencor.com

Date: 3/02/15  
Page: - 1 -

PACKING LIST  
CERTIFICATE OF CONFORMANCE  
NUMBER: B3QZXT1

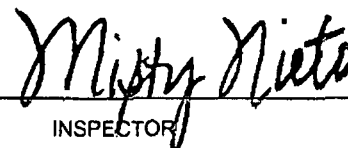
PO : 		Inv.: 							
CUSTOMER P.O. #	SHIP VIA	TERMS	BILL OF LADING NUMBER	WEIGHT	CARTONS	SALES REPRESENTATIVE			
74046FL	UPS	N30	1Z8426910343179803	1.00	1	Lizette Rivero			
Ship To: EAST COAST AVIATION SUPPL 399 EAST DRIVE MELBOURNE, FL 32904			Account # ECA750		Bill To: EAST COAST AVIATION SUPPLIES ATTN: ACCOUNTING 399 EAST DRIVE MELBOURNE, FL 32904 321-727-0047				
Ship Line Num.	Part Number	Description	Quantity Ordered	Quantity This Shipment	Quantity Backorder	Manufacturer CAGE	Batch Number	Manufacture, Lube, Cure or Expiration Date	Document Control Number
3	MS16624-5012	ACCEPTED RING, RETAINING, EXTERNAL JW 3/9	500	500 He		07382	1632762001 - RCC		G11326

packlist07/01/01

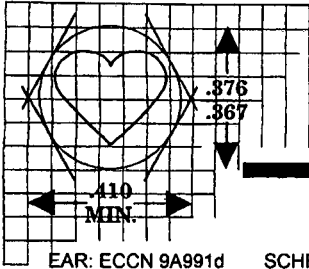
WE CERTIFY THAT THE ITEMS FURNISHED ON THIS ORDER CONFORM TO THE SPECIFICATIONS AND REQUIREMENTS DETAILED IN THE CONTRACT OR PURCHASE ORDER. EVIDENCE OF SUCH CONFORMANCE IS ON FILE WITH US OR OUR SUPPLIERS (SUBJECT TO EXAMINATION).

UNLESS SPECIFIED ABOVE, ITEMS ARE IN NEW, UNUSED CONDITION, ARE TRACEABLE TO APPROVED SOURCES (FAA, MIL-SPEC, OR COMMERCIAL) AND HAVE NOT BEEN OBTAINED FROM ANY U.S. GOVERNMENT OR MILITARY SOURCE.

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INSPECTOR

IT IS YOUR RESPONSIBILITY TO OBTAIN A VALIDATED EXPORT LICENSE FOR THIS MATERIAL FROM THE DEPARTMENT OF STATE OR THE DEPARTMENT OF COMMERCE IF SO REQUIRED UNDER THE APPLICABLE U.S. GOVERNMENT EXPORT CONTROL REGULATION. THE ABOVE MATERIAL IS NOT TO BE SHIPPED TO ANY COUNTRY THAT HAS AN EMBARGO PLACED ON IT BY THE U.S. GOVERNMENT.



# HEARTLAND

## PRECISION FASTENERS INC

301 Prairie Village Dr.  
New Century, Kansas 66031

Toll Free (877) 4HP-BOLT  
(447-2658)

Tele (913) 829-4447  
Fax (913) 829-7282

EAR: ECCN 9A991d SCHEDULE B: 7318.15.2000

CAGE CODE: 02C92

CERTIFICATE OF CONFORMANCE

ECAS INC.  
399 EAST DRIVE  
MELBOURNE, FL 32904

QTY: 2,500

PO#: 62445 #1

HEARTLAND PRECISION FASTENERS, INC CERTIFIES THAT THE FASTENERS IN THIS SHIPMENT HAVE BEEN MANUFACTURED IN ACCORDANCE WITH HPFI'S QUALITY SYSTEM MANUAL, HPQM-001, REVISION H, APPLICABLE DRAWINGS, SPECIFICATIONS AND CONTRACT REQUIREMENTS. DIMENSIONAL, MECHANICAL, METALLURGICAL AND FINISH TESTS WERE PERFORMED AND CONFORM TO SAID SPECIFICATIONS. TRACEABILITY INFORMATION IS MAINTAINED AND ON FILE BY LOT NUMBER PER HPQP-018. WE CERTIFY THAT THIS LOT WAS MANUFACTURED FREE FROM MERCURY, RADIUM, ALPHA SOURCE CONTAMINATION AND OZONE DEPLETING SUBSTANCES.

PAGE 1 OF 1

PART: MS21250-06018	REVISION: 1	LOT NO: 41771	CERT DATE: NOV 5 2012
DESCRIPTION: BOLT, TENSION, STEEL, EXTERNAL WRENCHING, FLANGED, 12 POINT	DFARS 252.225-7014 ALT I COMPLIANT	IN-PROCESS INIT. DATE: 6/8/12	MFG. DATE: 9/7/12
PROCUREMENT SPEC: NASM8831	REVISION: 3	HEADMARK: MS21250	
MATERIAL SPEC: AMS 6322	REVISION: N	GRADE: 8740	QUANTITY MANUFACTURED: 2,730
RAW MAT. CERT: SEE ATTACHED	HEAT: 10175090	SUPPLIER: WIRETECH	

### MECHANICAL TESTING

ULTIMATE TENSILE STRENGTH				DOUBLE SHEAR STRENGTH		HARDNESS	
POUNDS	FRACTURE	POUNDS	FRACTURE	POUNDS		ROCKWELL C SCALE	
19,283	THREAD	18,984	THREAD	24,692	24,806	TEST SAMPLES: 10	
18,886	THREAD	18,915	THREAD	24,526	24,672	TEST RANGE: 40-43	
19,162	THREAD	18,894	THREAD	24,652	24,715		
19,065	THREAD			24,652			
19,077	THREAD			24,626			
MIN:	17,100			MIN:	23,900	REQ'D: 39-43	

FATIGUE: (SEE ATTACHED)

STRESS DURABILITY: (SAMPLE PCS: 5; LOAD APPLIED: 14,535 LBS; DISCONTINUED AFTER: 23 HOURS) PASS

### METALLURGICAL TESTING

MAG=100x	SAMPLE SIZE	DISCONTINUITIES	SURFACE CONTAMINATION:	GRAIN FLOW:	MICROSTRUCTURE:
NITAL	5	ACCEPTABLE	NONE	ACCEPTABLE	SATISFACTORY

### SPECIAL PROCESSES:

HEAT TREATMENT PER AMS 2759/1 REV E (SEE ATTACHED)

FINISH CADMIUM PLATE PER AMS-QQ-P-416(C) TYPE II, CLASS 2

THREADS .3750-24 UNJF-3A STANDARD PER AS8879(D)

NDT	MAGNETIC PARTICLE INSPECT PER ASTM E 1444-11	ACCEPT: 100%	REJECT: 0
-----	--	--------------	-----------

STAMP: AUTHORIZED QUALITY REPRESENTATIVE  
VERN MCHENRY

HPF 1801 REV. B DATED 4/21/10

THE ORIGINAL OF THIS CERTIFICATE HAS A RAISED SEAL & SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF HPFI LABORATORY.

ISO 9001: 2008 AND AS9100: 2009  
MADE IN THE UNITED STATES OF AMERICA



# WireTech, Inc.

6440 E. Canning Street  
Los Angeles, CA 90040  
Phone (323) 722-4933  
Fax (323) 721-2738

SOLD TO

Heartland Precision Fastener  
301 Prairie Village Drive  
New Century, KS 66031  
USA

WORK ORDER  
092495

## CERTIFICATION

HEAT NO.  
10175090  
SALES ORDER / RLS  
845301 / 1  
ISO 9001-2000 REGISTERED



MECHANICAL TESTING  
CERT # 911.01

CERT# 911.01

CUSTOMER P.O. 25866	CUSTOMER PART	QUANTITY 1,590 Lbs	CARRIERS 1	LADING NO 00098912	SHIPMENT DATE 08/15/2012			
<b>SPECIFICATION H078740-104920A</b> <b>A-8740, AQ, SKFG, CHQ WIRE, SEAM &amp; DECARB FREE, SAIP Zinc Phosphate, Lime &amp; Stearate Coating,</b> <b>Size:0.491/0.493 Specifications: AMS 2301K, AMS6322N, MIL-S-6049A,AMEND. 1, AMS-S-6049-A</b>								
<b>CERTIFICATION REQUIREMENTS</b>								
<b>Chemical Properties</b>								
C .40	Si .27	Mn .86	P .01	S .006	Cu .1	Ni .44	Cr .55	Mo .21
<b>Physical Properties</b>								
Grain Size Jominy 1 6 J5=55	Jominy 2 J8=48	Jominy 3 J10=46	Inclusions S2-R1-C2	Macro GOOD	Cleanliness F&S=0	Mill Source Charter		
Country of Origin USA - DFAR Compliant								
<b>Mechanical Properties</b>								
<b>TEST</b>	<b>UNITS</b>					<b>Results</b>		
Tensile Strength	KSI					83.2		
Decarb (Total)	In					0.00		
Yield Strength	KSI					70.7		
% Elongation	%					27.5		
% Reduction of Area	%					70.3		
Rockwell Hardness B Scale	HRB (s)					86		

Merchandise covered by this invoice is warranted to be free from defects in workmanship or material but not for any specific length of time, type or measure of service. No claim for allowance will be recognized unless presented in writing within 10 days time after receipt of material. Our maximum liability for any claim predicated upon defective merchandise is limited to replacement of it, or to repayment of it, or to repayment of the purchase price thereof, as we elect. Material cut to specific length or size cannot be returned for credit and request for cancellation of such orders will not be considered if manufacture has been commenced. Buyer, by acceptance of the merchandise covered by this invoice, agrees to the foregoing terms and conditions and those set forth on the reverse hereof. \*The recording of false, fictitious or fraudulent statements or entries on this document may be punished as a felony under Federal statutes including Federal law, Title 18, Chapter 47.\*

REPRODUCTION OF THIS CERTIFICATION IS NOT ALLOWED UNLESS IN FULL.

Wire Tech, Inc. metallurgical laboratory is accredited in the following test: chemical analysis per ASTM E 415, mechanical testing per ASTM A 370, Rockwell hardness per ASTM E 18, metallographic mount preparation per ASTM E 3, decarburization depth per ASTM E 1077, IFI 140, inclusion rating per ASTM E 45, decarburization performed as per IFI 140. The reported Chemical and Physical Properties are Mill Source results. Transcribed from mill certificates. HRB(W) are hardness results performed with a 1/16" carbide ball. Unless otherwise specified, HRB and HRC results are conversions from ASTM A370 tables 1 and 2. \*Test result not covered by our current A2LA accreditation. Tests which have been undertaken by a subcontractor laboratory that is not accredited are not endorsed by A2LA or covered by Wire Tech, Inc. A2LA accreditation.

TEST RESULTS RELATE ONLY TO THE ITEMS TESTED.

DFAR Material per Clauses 252.225-7014 ALT. 1, 252.225-7009, & 225.003(9)

"LATEST REVISIONS OF ASTM"

Material is free of mercury, radium, or alpha contamination.



# CHARTER STEEL

A Division of  
Charter Manufacturing Company, Inc.

EMAIL

1658 Cold Springs Road  
Saukville, Wisconsin 53080  
(262) 268-2400  
1-800-437-8789  
FAX (262) 268-2570

## CHARTER STEEL TEST REPORT

Reverse Has Text And Codes

Wiretech Incorporated  
6440 East Canning Street  
Attn: Andre Stephan  
Los Angeles, CA-90040

Cust P.O.	6774-5
Customer Part #	8740C1A170-C
Charter Sales Order	70028555
Heat #	10175090
Ship Lot #	4121247
Grade	8740 R SK FG AQ 43/64
Process	HRSA
Finish Size	43/64

I hereby certify that the material described herein has been manufactured in accordance with the specifications and standards listed below and on the reverse side, and that it satisfies these requirements.

### Test Results of Heat Lot# 10175090

Lab Code: 7388	C	MN	P	S	SI	NI	CR	MO	CU	SN	V
CHEM	.40	.86	.010	.006	.27	.44	.55	.21	.10	.008	.001
%Wt											
	AL	N	B	TI	NB						
	.024	.0060	.0001	.001	.002						
JOMINY(HRC)	JOM01	JOM02	JOM03	JOM04	JOM05	JOM06	JOM07	JOM08	JOM09	JOM10	JOM12
	56	56	56	56	55	52	50	48	47	46	43
	JOM14	JOM16	JOM18	JOM20	JOM24	JOM28	JOM32				
	41	38	37	36	34	32	31				

JOMINY SAMPLE TYPE ENGLISH = C  
MACRO ETCH SURFACE = 1 MACRO ETCH RANDOM = 1 MACRO ETCH CENTER = 1  
AMS 2301 FREQUENCY AVERAGE = .00 AMS 2301 FREQUENCY INDIVIDUAL = .00  
AMS 2301 SEVERITY AVERAGE = .00 AMS 2301 SEVERITY INDIVIDUAL = .00  
CHEM. DEVIATION EXT.-GREEN =

### Test Results of Rolling Lot# 1059027

REDUCTION RATIO = 85:1

### Test Results of Processing Lot# 4121183, 4121247

	# of Tests	Min Value	Max Value	Mean Value	
TENSILE	2.0	83.2	83.3	83.2	TENSILE LAB = 0358-02
REDUCTION OF AREA	2	64	66	65	RA LAB = 0358-02
ROCKWELL B	2	83	83	83	RB LAB = 0358-02

NUM DECARB = 2 FREE FERRITE DECARB = .000 FREE FERR & PARTIAL DECARB = .003  
CP SPHERO % LAB = 0358-02 NUM SPHERO = 2 SPHERODIZATION = 83.8

Specifications: Manufactured per Charter Steel Quality Manual Rev 9,08-01-09  
Meets customer specifications with any applicable Charter Steel exceptions for the following customer documents:  
Customer Document = AMS6322N/AMS2301K/COP3010M/BS2S147:1976 CHEM ONLY Revision = Dated =

Additional Comments:

Charter Steel  
Saukville, WI, USA



Page 1 of 1

This MTR supersedes all previously dated MTRs for this order

*Janice Barnard*  
Janice Barnard  
Manager of Quality Assurance  
02/14/2012

Rem: Load1,Fax0,Mail0

The following statements are applicable to the material described on the front of this Test Report:

1. Except as noted, the steel supplied for this order was melted, rolled, and processed in the United States meeting DFAR's compliance.
2. Mercury was not used during the manufacture of this product, nor was the steel contaminated with mercury during processing.
3. Unless directed by the customer, there are no welds in any of the coils produced for this order.
4. The laboratory that generated the analytical or test results can be identified by the following key:

Certificate Number	Lab Code	Laboratory		Address
0358-01	7388	CSSM	Charter Steel Melting Division	1653 Cold Springs Road, Saukville, WI 53080
0358-02	8171	CSSR/CSSP	Charter Steel Rolling/Processing Division	1658 Cold Springs Road, Saukville, WI 53080
0358-03	123633	CSFP	Charter Steel Ohio Processing Division	6255 US Highway 23, Risingsun, OH 43457
0358-04	125544	CSCM/CSCR	Charter Steel Cleveland	4300 E. 49th St., Cuyahoga Heights, OH 44125-1004
.	.	--	Subcontracted test performed by laboratory not in Charter Steel system	

5. When run by a Charter Steel laboratory, the following tests were performed according to the latest revisions of the specifications listed below, as noted in the Charter Steel Laboratory Quality Manual:

Test	Specification	CSSM	CSSR/CSSP	CSFP	CSCM/CSCR
Chemistry Analysis	ASTM E415; ASTM E1019	X			X
Macroetch	ASTM E381	X			X
Hardenability (Jominy)	ASTM A255; SAE J406; JIS G0561	X			X
Grain Size	ASTM E112	X	X	X	X
Tensile Test	ASTM E8; ASTM A370		X	X	X
Rockwell Hardness	ASTM E18; ASTM A370	X	X	X	X
Microstructure (spheroidization)	ASTM A892		X	X	
Inclusion Content (Methods A, E)	ASTM E45		X		X
Decarburization	ASTM E1077		X	X	X

Charter Steel has been accredited to perform all of the above tests by the American Association for Laboratory Accreditation (A2LA). These accreditations expire 01/31/13.

All other test results associated with a Charter Steel laboratory that appear on the front of this report, if any, were performed according to documented procedures developed by Charter Steel and are not accredited by A2LA.

6. The test results on the front of this report are the true values measured on the samples taken from the production lot. They do not apply to any other sample.
7. This test report cannot be reproduced or distributed except in full without the written permission of Charter Steel. The primary customer whose name and address appear on the front of this form may reproduce this test report subject to the following restrictions:
  - It may be distributed only to their customers
  - Both sides of all pages must be reproduced in full
8. This certification is given subject to the terms and conditions of sale provided in Charter Steel's acknowledgement (designated by our Sales Order number) to the customer's purchase order. Both order numbers appear on the front page of this Report.
9. Where the customer has provided a specification, the results on the front of this test report conform to that specification unless otherwise noted on this test report.





PAULO HEAT TREATERS  
PRODUCTS AND FINISHERS  
COMPANY OF METAL

4827 CHELSEA AVENUE  
KANSAS CITY, MO 64130  
TEL: (816)861-7500  
FAX: (816)924-7300

## CERTIFIED INSPECTION REPORT

S  
O  
L  
D  
T  
O  
HEARTLAND PRECISION FASTENERS  
301 PRAIRIE VILLAGE DR  
NEW CENTURY, KS 66031

PAULO #: 1128877-08  
DATE: 10/05/2012  
DATE REC'D: 09/28/2012  
SHIP TO CODE:

PART DESC: CROSS SECTION .3739 X 1.770L  
PART NAME: BOLT  
PART #: MS21250-06018  
QUANTITY: 2921 PCS  
MATERIAL: 8740

CUSTOMER PO:  
CUSTOMER DRAY:  
CUSTOMER JOB: 41771  
LOT #:  
OTHER #:

### INSPECTION RESULTS:

CORE HARDNESS  
Count: 5  
Range: 41 -42 HRC

### Requirements:

Process per HEARTLAND PRECISION FASTENERS spec  
HPQP-057, HO0079 rev NEW.  
and per SAE spec AMS 2759/1 rev E,  
as referenced in SAE spec AMS-H-6875 rev B.  
Core hardness 40-43 HRC



OCT 04 2012

Certified Furnace # 501 Cycle/Load # 9  
High heat temp: 1550±25° F Soak time: 80min  
Quench: Oil  
Temper furnace: 531 Temper temp/time: 815±15° F/ 2hrs

\*Paulo is responsible for hardness testing only, customer responsible for all other testing. Paulo is not responsible for tensile testing\*

I CERTIFY THAT APPLICABLE MATERIAL PROCESSES HAVE BEEN PERFORMED IN ACCORDANCE WITH THE SPECIFICATION SHOWN ABOVE.  
I HAVE INSPECTED THE WORK AND THE SAMPLING AND RESULTS ARE AS INDICATED.

Approved By

Inspector Signature

NOV 02 2012



Element Materials Technology  
15062 Bolsa Chica  
Huntington Beach, CA  
92649-0223 USA

P 714 892 1961  
F 714 892 8159  
T 888 786 7555  
info.hb@element.com  
element.com

Contact: Donna Warner  
Heartland Precision Fasteners  
301 Prairie Village Drive  
P.O.  
NEW CENTURY, KS 66031

**TEST CERTIFICATE — EAR-CONTROLLED DATA**

Date: 11/2/2012  
Purchase Order Number: 41771  
Work Order Number: HEA016-10-23-99796-1

Part No.:	MS21250-06018
Lot No.:	41771
Ref:	TYPE I
Part Revision:	1
Specification:	NASM 8831 (4)

**TENSION FATIGUE AT ROOM TEMPERATURE**

Tested in Accordance with:

MIL-STD-1312-11A / NASM 1312-11

Testing Nut Type:

MIL-STD-1312-11A TYPE A

Requirements:

Minimum Cycles: 100,000  
Average Cycles: N/A  
Discontinue After: 130,000 Cycles  
High Load: 7,860 lbs.  
Low Load: 786 lbs.  
Frequency: 15 Hz

Sample	Number of Cycles	Location of Fracture
1	130,000	DISCONTINUED
2	130,000	DISCONTINUED
3	104,547	THREAD
4	130,000	DISCONTINUED
5	130,000	DISCONTINUED
6	108,073	THREAD

**MATERIAL CONFORMS TO SPECIFICATION**

This document contains technical data whose export and re-export/retransfer is subject to control by the U.S. Department of Commerce under the Export Administration Act and the Export Administration Regulations. The Department of Commerce's prior written approval may be required for the export or re-export/retransfer of such technical data to any foreign person, foreign entity or foreign organization whether in the United States or abroad.

Respectfully submitted

Kelly Nguyen  
Senior Quality Administrator

15062 Bolsa Chica, Huntington Beach, CA 92649  
(714) 892-1961 ph • (714) 892-8159 fax www.element.com

The information contained in this certification represents only the material submitted and is certified only for the quantities tested. Reproduction except in full is reserved pending written approval. The recording of false, fictitious, or fraudulent statements or entries on the certificate may be punishable as a felony under federal law. All testing was performed in a mercury free environment. **All testing performed in accordance with the latest edition of the applicable ASTM, or other Federal Test Method in effect at the time of test.**